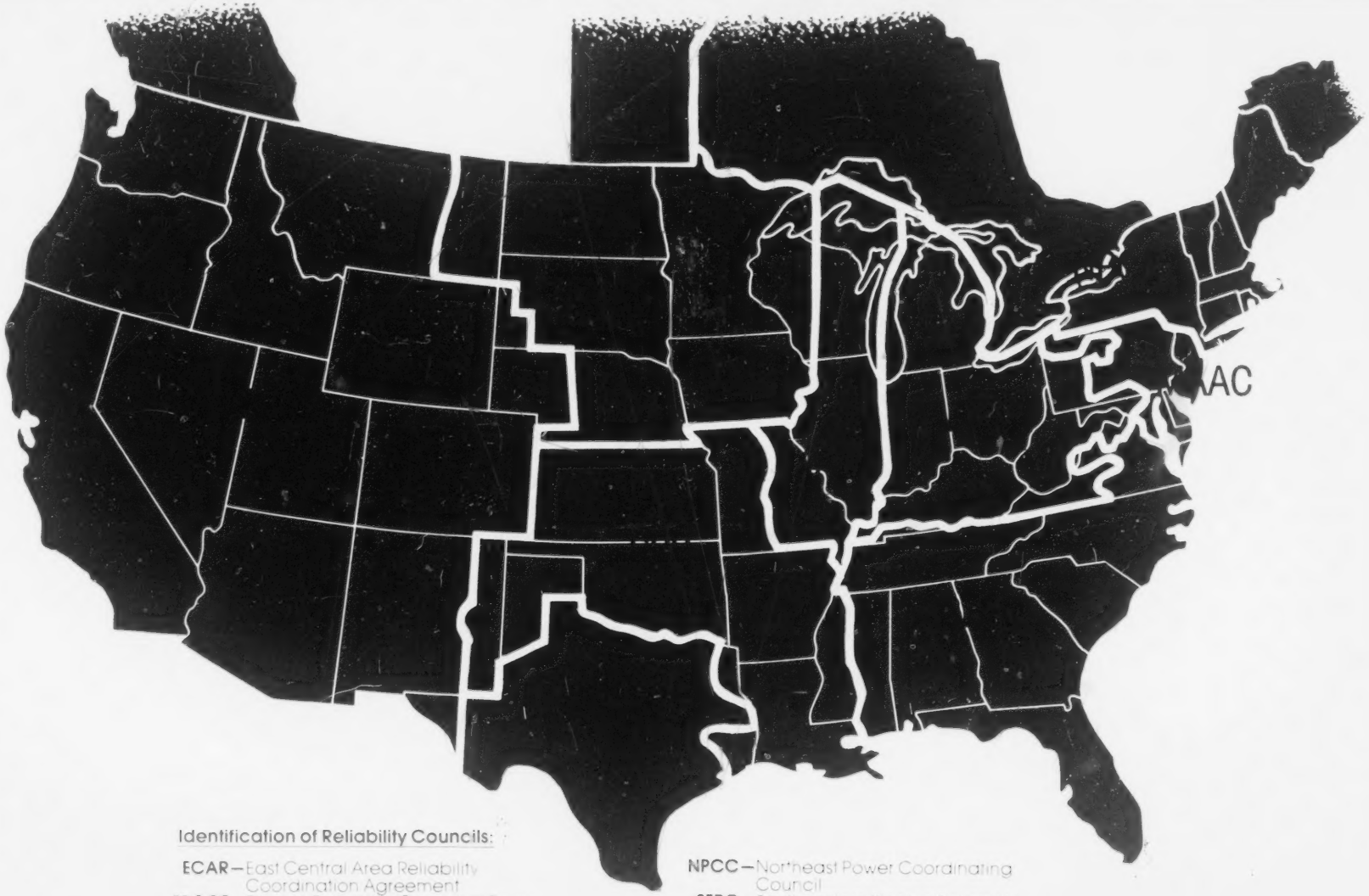
# 1981 ANNUAL ELECTRIC POWER SURVEY

A Report of the Electric Power Survey Committee of the

**EDISON ELECTRIC INSTITUTE** The association of electric companies

Regional Reliability Councils of the National Electric Reliability Council




Identification of Reliability Councils:

**ECAR**—East Central Area Reliability Coordination Agreement
**ERCOT**—Electric Reliability Council of Texas
**MACC**—Mid-Atlantic Area Council
**MAIN**—Mid-America Interpool Network
**MARCA**—Mid-Continent Area Reliability Coordination Agreement
**NPCC**—Northeast Power Coordinating Council
**SERC**—Southeastern Electric Reliability Council
**SPP**—Southwest Power Pool
**WSCC**—Western Systems Coordinating Council

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C. E. Winn, Tennessee Valley Authority

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H. K. Stadlbauer, Siemens Corp., Iselin, New Jersey
Z. Stanley Stys, Brown Boveri Corp., North Brunswick, New Jersey
K. Yamawaki, Japan Electric Power Survey Committee, Tokyo, Japan
Hirokichi Yoshiyama, Hitachi, Ltd., Tokyo, Japan

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# 1981 ANNUAL ELECTRIC POWER SURVEY

## FOREWORD

The electric power supply data shown in Part I of this report are derived partly from ERA-411 reports for the years 1979 through 1981 submitted to the United States Department of Energy, and partly by direct reports to the head office of the National Electric Reliability Council (NERC) in Princeton, New Jersey, by the regional reliability councils. Forecast values used herein are those checked and validated by NERC HQ and published in their report, ELECTRIC POWER SUPPLY AND DEMAND 1981-1990. Historical capability values are estimated by EEI based on a combination of data obtained from previous editions of the NERC report and from 1979 and 1980 ERA-411 submissions to the Department of Energy.

Heretofore, Annual Electric Power Survey power supply figures had been obtained by means of questionnaires sent to the regional and subregional utility reporting entities by EEI on behalf of the Electric Power Survey Committee. The historical and forecast power supply data in this report are all from the new data source (NERC) and are internally consistent. Breaks in the series can be observed, however, if the historical values for 1979 are compared with those published in the 1980 Annual Electric Power Survey, values which were obtained through EEI's own survey conducted as of April 1, 1980. Variances in some series range up to seven percent for certain regional values due to the change from EEI to NERC definitions for capability, peak load, and kilowatt-hour requirements. Fortunately, the regional variances offset one another to such an extent that the differences in 1979 historical values for the sum of the nine regions amount to no more than 0.9 percent.

Data in this survey represent the entire electric utility industry of the contiguous United States, including investor-owned systems and those of governmental agencies – Federal, Municipal and State & Local – and also rural electric cooperatives. Blow-up factors formerly used to expand the sum of the nine regions to values entitled "Total Electric Utility Industry of the Contiguous United States" are no longer considered necessary and have been dropped with the change to the new data source.

The reported data include some industrial power installations whose operations are coordinated with the utility systems with which they are interconnected and which thereby contribute to the public supply. The data do not include any isolated industrial or institutional power installations.

Survey results pertaining to power system capabilities, loads, capability margins, kilowatt-hour requirements and fuel data are presented for each of the nine reliability councils of NERC. Boundaries of the nine reliability councils are shown by the map in Fig.1. The National Electric Reliability Council encompasses essentially all utility systems in the United States and four Canadian provinces, but the data presented in this survey cover only the systems in the contiguous United States. Summations of these regional data are presented and referred to as "Survey Totals for the Nine Regions."

Part II of this report presents the results of the quarterly survey on the manufacture and scheduling of heavy electric power equipment made as of April 1, 1981, by the Electric Power Survey Committee of the Edison Electric Institute in cooperation with representatives of the electric power systems or power areas throughout the contiguous United States, with the nation's principal manufacturers of heavy electric power equipment, and with those foreign manufacturers supplying electric generating equipment to U.S. electric power systems.

The Electric Power Survey Committee is the only group servicing the electric utility and allied industries that conducts surveys on the manufacture and scheduling of heavy electric power equipment on a quarterly basis. These quarterly surveys are also unique in that information on each planned project is cross checked with both the manufacturer and the system ordering the equipment. Furthermore, the time frame for ordered and scheduled units is not limited to ten years, but extends into the future as far out as equipment is officially ordered and scheduled for installation. The resulting data base also allows the quarterly tracking of unit slippages and cancellations.

Forecasts presented in this report are based on the best information available as of April 1, 1981. There could, however, be delays in the installation of scheduled capability and reductions in the capability margins based on the scheduled capability. This may occur due to the inability of utilities to secure the financing necessary to sustain the construction of new generating capacity. The delay or denial of necessary rate increases, the cost of complying with continually changing regulations, and rapidly escalating fuel costs could also adversely affect the financial condition of the industry. Furthermore, the capability of generating units now operational could be restricted due to fuel availability problems or environmental operating requirements. It is essential that the installation of both nuclear and coal-fired generating units proceed as currently scheduled and that conservation and load management programs be pursued at the same time to assure an adequate bulk electric power supply in the 1980's.

Definitions of the terms used in this report, together with information concerning methods of summarizing the data, appear on the following page.

# DEFINITIONS AND METHODS OF SUMMARIZATION

**Capability** of the power systems, as used herein, is equivalent to Planned Resources, defined by the National Electric Reliability Council to include "the total installed generating capacity which is existing, presently under construction, or in various stages of planning; plus scheduled capacity purchases, less capacity sales; less total generating capacity out of service in deactivated shutdown status."

This capability must provide for scheduled maintenance, emergency outages, and system operating requirements, in addition to the estimated load and any unforeseen load.

The capability of existing installations is determined by the net dependable capacity at the time of the peak load and the kilowatt-hour requirements of the system. Estimated capabilities of those systems served wholly or in part by hydraulic power sources are determined for adverse hydro conditions.

The capabilities of all systems normally interconnected are based upon fully coordinated operation. Peak capability refers to the maximum capability, as defined above, at the approximate time and for the duration of the load referred to, that is, at the time of the summer peak load or the winter peak load.

Regional capability, as reported herein, is the sum of the capabilities of the systems serving the region.

**Peak Load** is the maximum load encountered on the system during a given period of time.

Regional summer and winter peak loads represent the non-coincident maximum loads occurring during these two seasons.

Regional peak loads as reported herein are the sum of the peak loads on the systems serving the region, less demands which are interruptible by contract.

**Capability Margin** is the difference between net system capability and system maximum load requirements (peak load). It is the margin of capability available to provide for scheduled maintenance, emergency outages, system operating requirements, and unforeseen loads. On a regional or national basis, it is the difference between aggregate net system capability of the various systems in the region or nation and the sum of system maximum (peak) loads without allowance for time diversity between the loads of the several systems. However, within a region account is taken of diversity between peak loads of systems that are operated as a closely coordinated power pool.

# PART I/ELECTRIC POWER SUPPLY

## SUMMER PEAK CAPABILITIES, PEAK LOADS, AND CAPABILITY MARGINS

Summer peak capabilities, peak loads, and capability margins as recorded for the years 1979 and 1980, and as now forecast for the years 1981 through 1990, on the basis of adverse hydro conditions, are shown in Table I, page 6. Similar information for winter is shown in Table II, page 8.

Fig. 2, page 10, is a graphic presentation of the summer situation for the total electric utility industry of the contiguous United States during the period 1954 through 1980. As mentioned in the FOREWORD, there is a break in the series between 1978 and 1979. The chart also includes the present forecasts for the summer of the years 1981 through 1990 based on adverse hydro conditions.

### SUMMER CAPABILITIES

The summer capability forecasts shown by this survey are below the values indicated in the 1980 Annual Survey of last April. For the nine regions taken together, reductions range from 2.2 percent to 4.0 percent for the years 1981 through 1989.

The 1990 summer capability of the sum of the nine regions is forecast at 750.6 million kilowatts. This represents an average annual increase of 3.0 percent for the ten-year period from the summer of 1980.

### SUMMER PEAK LOADS

Preliminary figures published in the 1980 Post-Summer Electric Power Survey indicated that the 1980 summer peak load was up 6.5 percent over 1979. According to final data now available, the actual increase in the 1980 summer peak load was 7.2 percent.

Summer peak load forecasts have been reduced by almost all reliability councils. For the nine regions taken together, reductions range from 0.8 percent to 3.8 percent for the years 1981 through 1989, compared with values shown for those years in the April 1980 Survey.

The summer peak load for the sum of the nine regions, which was 427.1 million kilowatts in 1980, is forecast to reach 430.4 million kilowatts in 1981, an increase of 0.8 percent. For the summer of 1990, the forecast is 582.7 million kilowatts. This is an average annual increase of 3.2 percent for the ten-year period from the summer of 1980.

The average annual increase in the winter peak load for the same ten-year period is 3.5 percent.

### SUMMER CAPABILITY MARGINS

Of the 81 summer capability margin percentages shown for the nine-year period 1981–1989 for the nine reliability councils, 55 of the values are higher than those in the April Survey of a year ago, and 26 of the percent margins are lower. ECAR, SERC, SPP, MARCA, and WSCC show consistently higher margins from 1981 through 1989, while six of ERCOT's annual margins are higher and three are lower. NPCC and MAAC margins are consistently lower, but reductions in MAIN's percent margins for the five years 1981–1985 are followed by increases for the four years through 1989.

Summer capability margins for the country as a whole are higher from 1981 through 1989, generally because peak load forecasts have been reduced more than expected capabilities. As now forecast, the summer capability margins for the country range from 33.1 percent in 1983 to 28.8 percent in 1990, shown in these surveys for the first time.

## Table I SUMMER CAPABILITIES, PEAK LOADS, AND RESERVE MARGINS (Thousands of Kilowatts)

| Regions | | Actual 1979 | 1980 | % Inc | 1981 | % Inc | 1982 | % Inc | 1983 | % Inc |
|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | Capability Scheduled | 51,778 | 52,038 | 0.5 | 51,681 | 0.7 – | 52,010 | 0.6 | 54,070 | 4.0 |
| | Peak Load | 34,673 | 36,831 | 6.2 | 35,950 | 2.4 – | 36,550 | 1.7 | 37,210 | 1.8 |
| | Capability Margin | 17,105 | 15,207 | | 15,731 | | 15,460 | | 16,860 | |
| | Capability Margin, % | 49.3 | 41.3 | | 43.8 | | 42.3 | | 45.3 | |
| MAAC | Capability Scheduled | 44,633 | 45,137 | 1.1 | 44,554 | 1.3 – | 45,970 | 3.2 | 46,914 | 2.1 |
| | Peak Load | 31,780 | 34,525 | 8.6 | 33,845 | 2.0 – | 34,905 | 3.1 | 35,775 | 2.5 |
| | Capability Margin | 12,853 | 10,612 | | 10,709 | | 11,065 | | 11,139 | |
| | Capability Margin, % | 40.4 | 30.7 | | 31.6 | | 31.7 | | 31.1 | |
| ECAR | Capability Scheduled | 86,532 | 87,416 | 1.0 | 88,582 | 1.3 | 92,026 | 3.9 | 93,456 | 1.6 |
| | Peak Load | 61,716 | 63,021 | 2.1 | 63,838 | 1.3 | 66,296 | 3.9 | 69,240 | 4.4 |
| | Capability Margin | 24,816 | 24,395 | | 24,744 | | 25,730 | | 24,216 | |
| | Capability Margin, % | 40.2 | 38.7 | | 38.8* | | 38.8* | | 35.0* | |
| SERC | Capability Scheduled | 108,392 | 110,220 | 1.7 | 118,320 | 7.3 | 122,615 | 3.6 | 126,563 | 3.2 |
| | Peak Load | 83,209 | 89,815 | 7.9 | 88,620 | 1.3 – | 92,180 | 4.0 | 95,568 | 3.7 |
| | Capability Margin | 25,183 | 20,405 | | 29,700 | | 30,435 | | 30,995 | |
| | Capability Margin, % | 30.3 | 22.7* | | 33.5* | | 33.0* | | 32.4* | |
| MAIN | Capability Scheduled | 44,395 | 42,737 | 3.7 – | 41,648 | 2.5 – | 42,725 | 2.6 | 44,924 | 5.1 |
| | Peak Load | 33,751 | 33,894 | 0.4 | 34,890 | 2.9 | 36,072 | 3.4 | 37,100 | 2.8 |
| | Capability Margin | 10,644 | 8,843 | | 6,758 | | 6,653 | | 7,824 | |
| | Capability Margin, % | 31.5 | 26.1 | | 19.4 | | 18.4 | | 21.1 | |
| SPP | Capability Scheduled | 47,661 | 51,509 | 8.1 | 55,189 | 7.1 | 58,986 | 6.9 | 62,658 | 6.2 |
| | Peak Load | 37,607 | 44,981 | 19.6 | 44,019 | 2.1 – | 46,017 | 4.5 | 47,838 | 4.0 |
| | Capability Margin | 10,054 | 6,528 | | 11,170 | | 12,969 | | 14,820 | |
| | Capability Margin, % | 26.7 | 14.5 | | 25.4 | | 28.2 | | 31.0 | |
| ERCOT | Capability Scheduled | 40,085 | 42,248 | 5.4 | 42,526 | 0.7 | 44,508 | 4.7 | 45,498 | 2.2 |
| | Peak Load | 27,828 | 31,722 | 14.0 | 32,728 | 3.2 | 34,414 | 5.2 | 35,925 | 4.4 |
| | Capability Margin | 12,257 | 10,526 | | 9,798 | | 10,094 | | 9,573 | |
| | Capability Margin, % | 44.0 | 33.2 | | 29.9 | | 29.3 | | 26.6 | |
| MARCA | Capability Scheduled | 23,972 | 26,268 | 9.6 | 28,146 | 7.1 | 28,347 | 0.7 | 29,952 | 5.7 |
| | Peak Load | 18,132 | 19,378 | 6.9 | 19,912 | 2.8 | 20,866 | 4.8 | 21,776 | 4.4 |
| | Capability Margin | 5,840 | 6,890 | | 8,234 | | 7,481 | | 8,176 | |
| | Capability Margin, % | 32.2 | 35.6 | | 41.4 | | 35.9 | | 37.5 | |
| WSCC | Capability Scheduled | 97,880 | 100,966 | 3.2 | 99,634 | 1.3 – | 104,884 | 5.3 | 111,106 | 5.9 |
| | Peak Load | 69,728 | 72,891 | 4.5 | 76,596 | 5.1 | 79,320 | 3.6 | 81,820 | 3.2 |
| | Capability Margin | 28,152 | 28,075 | | 23,038 | | 25,564 | | 29,286 | |
| | Capability Margin, % | 40.4* | 38.5 | | 30.1 | | 32.2 | | 35.8 | |
| Survey Totals for the Nine Regions – Summer | Capability Scheduled | 545,328 | 558,539 | 2.4 | 570,280 | 2.1 | 592,071 | 3.8 | 615,141 | 3.9 |
| | Annual Increase | | 13,211 | | 11,741 | | 21,791 | | 23,070 | |
| | Peak Load | 398,424 | 427,058 | 7.2 | 430,398 | 0.8 | 446,620 | 3.8 | 462,252 | 3.5 |
| | Annual Increase | | 28,634 | | 3,634 | | 16,222 | | 15,632 | |
| | Capability Margin | 146,904 | 131,481 | | 139,882 | | 145,451 | | 152,889 | |
| | Capability Margin, % | 36.9 | 30.8 | | 32.5 | | 32.6 | | 33.1 | |

*Peak occurred, or is expected to occur, in winter.

| 1984 | % Inc | 1985 | % Inc | 1986 | % Inc | 1987 | % Inc | 1988 | % Inc | 1989 | % Inc | 1990 | % Inc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54,088 | 0.0 | 55,880 | 3.3 | 56,915 | 1.9 | 59,587 | 4.7 | 60,610 | 1.7 | 60,501 | 0.2 – | 61,146 | 1.1 |
| 37,920 | 1.9 | 38,550 | 1.7 | 39,270 | 1.8 | 40,020 | 1.9 | 40,850 | 2.1 | 41,690 | 2.1 | 42,540 | 2.0 |
| 16,168 | | 17,320 | | 17,645 | | 19,567 | | 19,760 | | 18,811 | | 18,606 | |
| 42.6 | | 44.9 | | 44.9* | | 48.9* | | 48.4* | | 45.1* | | 43.7* | |
| 47,859 | 2.0 | 48,529 | 1.4 | 48,730 | 0.4 | 49,447 | 1.5 | 52,189 | 5.5 | 52,744 | 1.1 | 53,924 | 2.2 |
| 36,715 | 2.6 | 37,535 | 2.2 | 38,435 | 2.4 | 39,255 | 2.1 | 40,075 | 2.1 | 40,875 | 2.0 | 41,755 | 2.2 |
| 11,144 | | 10,994 | | 10,295 | | 10,192 | | 12,114 | | 11,869 | | 12,169 | |
| 30.4 | | 29.3 | | 26.8 | | 26.0 | | 30.2 | | 29.0 | | 29.1 | |
| 98,340 | 5.2 | 102,428 | 4.2 | 106,226 | 3.7 | 108,006 | 1.7 | 110,853 | 2.6 | 115,384 | 4.1 | 115,961 | 0.5 |
| 71,766 | 3.7 | 73,996 | 3.1 | 76,197 | 3.0 | [illegible] | 3.3 | 81,713 | 3.8 | 84,518 | 3.4 | 86,847 | 2.8 |
| 26,574 | | 28,432 | | [illegible] | | 29,[illegible]7 | | 29,140 | | 30,866 | | 29,114 | |
| 37.0* | | 38.4* | | 39.4* | | 37.3* | | 35.7* | | 36.5* | | 33.5* | |
| 131,963 | 4.3 | 136,006 | 3.1 | 140,101 | 3.0 | 145,859 | 4.1 | 150,816 | 3.4 | 155,961 | 3.4 | 157,633 | 1.1 |
| 98,971 | 3.6 | 102,423 | 3.5 | 106,400 | 3.9 | 111,083 | 4.4 | 114,679 | 3.2 | 118,537 | 3.4 | 122,697 | 3.5 |
| 32,992 | | 33,583 | | 33,701 | | 34,776 | | 36,137 | | 37,424 | | 34,936 | |
| 33.3* | | 32.8* | | 31.7* | | 31.3 | | 31.5 | | 31.6 | | 28.5 | |
| 47,398 | 5.5 | 48,906 | 3.2 | 50,565 | 3.4 | 52,144 | 3.1 | 52,975 | 1.6 | 53,620 | 1.2 | 53,622 | 0.0 |
| 38,160 | 2.9 | 39,265 | 2.9 | 40,397 | 2.9 | 41,637 | 3.1 | 42,823 | 2.8 | 44,009 | 2.8 | 45,284 | 2.9 |
| 9,238 | | 9,641 | | 10,168 | | 10,507 | | 10,152 | | 9,611 | | 8,338 | |
| 24.2 | | 24.6 | | 25.2 | | 25.2 | | 23.7 | | 21.8 | | 18.4 | |
| 63,969 | 2.1 | 66,786 | 4.4 | 68,197 | 2.1 | 68,754 | 0.8 | 72,114 | 4.9 | 73,002 | 1.2 | 74,786 | 2.4 |
| 49,897 | 4.3 | 51,861 | 3.9 | 53,918 | 4.0 | 55,854 | 3.6 | 58,020 | 3.9 | 60,185 | 3.7 | 62,497 | 3.8 |
| 14,072 | | 14,925 | | 14,279 | | 12,900 | | 14,094 | | 12,817 | | 12,289 | |
| 28.2 | | 28.8 | | 26.5 | | 23.1 | | 24.3 | | 21.3 | | 19.7 | |
| 47,952 | 5.4 | 47,837 | 0.2 – | 49,994 | 4.5 | 52,353 | 4.7 | 54,401 | 3.9 | 57,527 | 5.7 | 59,903 | 4.1 |
| 37,722 | 5.0 | 39,402 | 4.5 | 41,337 | 4.9 | 43,136 | 4.4 | 45,064 | 4.5 | 47,098 | 4.5 | 48,949 | 3.9 |
| 10,230 | | 8,435 | | 8,657 | | 9,217 | | 9,337 | | 10,429 | | 10,954 | |
| 27.1 | | 21.4 | | 20.9 | | 21.4 | | 20.7 | | 22.1 | | 22.4 | |
| 30,109 | 0.5 | 30,567 | 1.5 | 31,627 | 3.5 | 31,945 | 1.0 | 32,581 | 2.0 | 33,239 | 2.0 | 33,436 | 0.6 |
| 22,664 | 4.1 | 23,476 | 3.6 | 24,304 | 3.5 | 25,098 | 3.3 | 25,974 | 3.5 | 26,820 | 3.3 | 27,760 | 3.5 |
| 7,445 | | 7,091 | | 7,323 | | 6,847 | | 6,607 | | 6,419 | | 5,676 | |
| 32.8 | | 30.2 | | 30.1 | | 27.3 | | 25.4 | | 23.9 | | 20.4 | |
| 115,046 | 3.5 | 118,410 | 2.9 | 122,342 | 3.3 | 129,113 | 5.5 | 134,160 | 3.9 | 136,837 | 2.0 | 140,173 | 2.4 |
| 85,013 | 3.9 | 88,006 | 3.5 | 90,796 | 3.2 | 93,971 | 3.5 | 97,582 | 3.8 | 101,201 | 3.7 | 104,363 | 3.1 |
| 30,033 | | 30,404 | | 31,546 | | 35,142 | | 36,578 | | 35,636 | | 35,810 | |
| 35.3 | | 34.5 | | 34.7 | | 37.4 | | 37.5 | | 35.2* | | 34.3 | |
| 636,724 | 3.5 | 655,349 | 2.9 | 674,697 | 3.0 | 697,208 | 3.3 | 720,699 | 3.4 | 738,815 | 2.6 | 750,584 | 1.6 |
| 21,583 | | 18,625 | | 19,348 | | 22,511 | | 23,491 | | 18,116 | | 11,769 | |
| 478,828 | 3.6 | 494,524 | 3.3 | 511,054 | 3.3 | 528,743 | 3.5 | 546,780 | 3.4 | 564,933 | 3.3 | 582,692 | 3.1 |
| 16,576 | | 15,696 | | 16,530 | | 17,689 | | 18,037 | | 18,153 | | 17,759 | |
| 157,896 | | 160,825 | | 163,643 | | 168,465 | | 173,919 | | 173,882 | | 167,892 | |
| 33.0 | | 32.5 | | 32.0 | | 31.9 | | 31.8 | | 30.8 | | 28.8 | |

## Table II WINTER CAPABILITIES, PEAK LOADS, AND RESERVE MARGINS (Thousands of Kilowatts)

| Regions | | Actual 1979/80 | 1980/81 | % Inc | 1981/82 | % Inc | 1982/83 | % Inc | 1983/84 | % Inc |
|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | Capability Scheduled | 52,781 | 52,986 | 0.4 | 53,060 | 0.1 | 53,997 | 1.8 | 55,175 | 2.2 |
| | Peak Load | 34,552 | 35,340 | 2.3 | 35,490 | 0.4 | 36,170 | 1.9 | 36,980 | 2.2 |
| | Capability Margin | 18,229 | 17,646 | | 17,570 | | 17,827 | | 18,195 | |
| | Capability Margin, % | 52.8* | 49.9* | | 49.5* | | 49.3* | | 49.2* | |
| MAAC | Capability Scheduled | 46,789 | 47,638 | 1.8 | 46,567 | 2.2 – | 48,431 | 4.0 | 49,450 | 2.1 |
| | Peak Load | 27,858 | 29,730 | 6.7 | 29,855 | 0.4 | 30,925 | 3.6 | 31,965 | 3.4 |
| | Capability Margin | 18,931 | 17,908 | | 16,712 | | 17,506 | | 17,485 | |
| | Capability Margin, % | 68.0* | 60.2* | | 56.0* | | 56.6* | | 54.7* | |
| ECAR | Capability Scheduled | 88,369 | 89,836 | 1.7 | 91,731 | 2.1 | 95,396 | 4.0 | 97,948 | 2.7 |
| | Peak Load | 59,560 | 62,225 | 4.5 | 65,166 | 4.7 | 68,058 | 4.4 | 70,821 | 4.1 |
| | Capability Margin | 28,809 | 27,611 | | 26,565 | | 27,338 | | 27,127 | |
| | Capability Margin, % | 48.4* | 44.4* | | 40.8 | | 40.2 | | 38.3 | |
| SERC | Capability Scheduled | 113,566 | 116,472 | 2.6 | 122,379 | 5.1 | 126,731 | 3.6 | 132,028 | 4.2 |
| | Peak Load | 82,612 | 90,354 | 9.4 | 89,783 | 0.6 – | 93,361 | 4.0 | 96,416 | 3.3 |
| | Capability Margin | 30,954 | 26,118 | | 32,596 | | 33,370 | | 35,612 | |
| | Capability Margin, % | 37.5* | 28.9 | | 36.3 | | 35.7 | | 36.9 | |
| MAIN | Capability Scheduled | 44,456 | 42,212 | 5.0 – | 41,596 | 1.5 – | 44,700 | 7.5 | 47,452 | 6.2 |
| | Peak Load | 27,449 | 26,631 | 3.0 – | 28,549 | 7.2 | 29,661 | 3.9 | 30,815 | 3.9 |
| | Capability Margin | 17,007 | 15,581 | | 13,047 | | 15,039 | | 16,637 | |
| | Capability Margin, % | 62.0* | 58.5* | | 45.7* | | 50.7* | | 54.0* | |
| SPP | Capability Scheduled | 46,754 | 51,186 | 9.5 | 54,004 | 5.5 | 57,833 | 7.1 | 61,496 | 6.3 |
| | Peak Load | 28,289 | 30,681 | 8.5 | 32,528 | 6.0 | 33,871 | 4.1 | 35,288 | 4.2 |
| | Capability Margin | 18,465 | 20,505 | | 21,476 | | 23,962 | | 26,208 | |
| | Capability Margin, % | 63.3* | 66.8* | | 66.0* | | 70.7* | | 74.3* | |
| ERCOT | Capability Scheduled | 38,116 | 42,248 | 10.8 | 40,627 | 3.8 – | 44,664 | 9.9 | 44,833 | 0.4 |
| | Peak Load | 21,444 | 23,962 | 11.7 | 24,632 | 2.8 | 25,674 | 4.2 | 26,859 | 4.6 |
| | Capability Margin | 16,672 | 18,268 | | 15,995 | | 18,990 | | 17,974 | |
| | Capability Margin, % | 77.7* | 76.3* | | 64.9* | | 74.0* | | 66.9* | |
| MARCA | Capability Scheduled | 25,224 | 26,541 | 5.2 | 28,651 | 7.9 | 28,791 | 0.5 | 30,043 | 4.3 |
| | Peak Load | 17,269 | 17,420 | 0.9 | 18,250 | 4.8 | 19,074 | 4.5 | 19,936 | 4.5 |
| | Capability Margin | 7,955 | 9,121 | | 10,401 | | 9,717 | | 10,107 | |
| | Capability Margin, % | 46.1* | 52.4* | | 57.0* | | 50.9* | | 50.7* | |
| WSCC | Capability Scheduled | 98,470 | 103,076 | 4.7 | 102,469 | 0.6 – | 106,472 | 3.9 | 113,960 | 7.0 |
| | Peak Load | 69,843 | 68,224 | 2.3 – | 74,733 | 9.5 | 77,631 | 3.9 | 80,325 | 3.5 |
| | Capability Margin | 28,627 | 34,852 | | 27,736 | | 28,841 | | 33,635 | |
| | Capability Margin, % | 41.0 | 51.1* | | 37.1* | | 37.2* | | 41.9* | |
| Survey Totals for the Nine Regions – Winter | Capability Scheduled | 554,525 | 572,195 | 3.2 | 581,084 | 1.6 | 607,015 | 4.5 | 632,385 | 4.2 |
| | Annual Increase | | 17,670 | | 8,889 | | 25,931 | | 25,370 | |
| | Peak Load | 368,876 | 384,567 | 4.3 | 398,986 | 3.7 | 414,425 | 3.9 | 429,405 | 3.6 |
| | Annual Increase | | 15,691 | | 14,419 | | 15,439 | | 14,980 | |
| | Capability Margin | 185,649 | 187,628 | | 182,098 | | 192,590 | | 202,980 | |
| | Capability Margin, % | 50.3 | 48.8 | | 45.6 | | 46.5 | | 47.3 | |

*Peak occurred, or is expected to occur, in summer

| 1984/85 | % Inc | 1985/86 | % Inc | 1986/87 | % Inc | 1987/88 | % Inc | 1988/89 | % Inc | 1989/90 | % Inc | 1990/91 | % Inc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55,794 | 1.1 | 56,480 | 1.2 | 59,016 | 4.5 | 61,719 | 4.6 | 61,656 | 0.2 – | 62,265 | 1.1 | 62,224 | 0.1 – |
| 37,770 | 2.1 | 38,530 | 2.0 | 39,320 | 2.1 | 40,240 | 2.3 | 41,180 | 2.3 | 42,170 | 2.4 | 43,150 | 2.3 |
| 18,024 | | 17,950 | | 19,696 | | 21,479 | | 20,385 | | 20,095 | | 19,074 | |
| 47.7* | | 46.6* | | 50.1 | | 53.4 | | 49.5 | | 47.7 | | 44.2 | |
| 50,418 | 1.2 | 51,123 | 1.4 | 51,042 | 0.2 – | 52,851 | 3.5 | 54,539 | 3.2 | 55,074 | 1.0 | 56,232 | 2.1 |
| 32,985 | 3.2 | 33,955 | 2.9 | 34,905 | 2.8 | 35,975 | 3.1 | 36,905 | 2.6 | 37,875 | 2.6 | 38,835 | 2.5 |
| 17,433 | | 17,168 | | 16,137 | | 16,876 | | 17,634 | | 17,199 | | 17,397 | |
| 52.9* | | 50.6* | | 46.2* | | 46.9* | | 47.8* | | 45.4* | | 44.8* | |
| 103,421 | 5.6 | 106,162 | 2.7 | 109,625 | 3.3 | 110,673 | 1.0 | 115,935 | 4.8 | 117,720 | 1.5 | 118,886 | 1.0 |
| 73,186 | 3.3 | 75,515 | 3.2 | 78,212 | 3.6 | 81,207 | 3.8 | 84,221 | 3.7 | 86,742 | 3.0 | 89,412 | 3.1 |
| 30,235 | | 30,647 | | 31,413 | | 29,466 | | 31,714 | | 30,978 | | 29,474 | |
| 41.3 | | 40.6 | | 40.2 | | 36.3 | | 37.7 | | 35.7 | | 33.0 | |
| 134,002 | 1.5 | 141,332 | 5.5 | 144,697 | 2.4 | 149,062 | 3.0 | 153,239 | 2.8 | 158,733 | 3.6 | 159,802 | 0.7 |
| 99,720 | 3.4 | 103,205 | 3.5 | 107,191 | 3.9 | 110,931 | 3.5 | 114,306 | 3.0 | 118,150 | 3.4 | 121,892 | 3.2 |
| 34,282 | | 38,127 | | 37,506 | | 38,131 | | 38,933 | | 40,583 | | 37,910 | |
| 34.4 | | 36.9 | | 35.0 | | 34.4* | | 34.1* | | 34.3* | | 31.1* | |
| 49,676 | 4.7 | 50,827 | 2.3 | 52,524 | 3.3 | 53,012 | 0.9 | 54,190 | 2.2 | 54,484 | 0.5 | 55,313 | 1.5 |
| 31,920 | 3.6 | 33,103 | 3.7 | 34,302 | 3.6 | 35,616 | 3.8 | 36,882 | 3.6 | 38,213 | 3.6 | 39,530 | 3.4 |
| 17,756 | | 17,724 | | 18,222 | | 17,396 | | 17,308 | | 16,271 | | 15,783 | |
| 55.6* | | 53.5* | | 53.1* | | 48.8* | | 46.9* | | 42.6* | | 39.9* | |
| 63,814 | 3.8 | 66,357 | 4.0 | 67,938 | 2.4 | 68,394 | 0.7 | 71,456 | 4.5 | 72,749 | 1.8 | 74,412 | 2.3 |
| 36,768 | 4.2 | 38,252 | 4.0 | 39,817 | 4.1 | 41,311 | 3.8 | 42,939 | 3.9 | 44,590 | 3.8 | 46,370 | 4.0 |
| 27,051 | | 28,105 | | 28,121 | | 27,083 | | 28,517 | | 28,159 | | 28,042 | |
| 73.6* | | 73.5* | | 70.6* | | 65.6* | | 66.4* | | 63.2* | | 60.5* | |
| 45,611 | 1.7 | 45,860 | 0.5 | 50,436 | 10.0 | 51,844 | 2.8 | 55,717 | 7.5 | 58,568 | 5.1 | 60,123 | 2.7 |
| 28,277 | 5.3 | 29,623 | 4.8 | 31,238 | 5.5 | 32,808 | 5.0 | 34,333 | 4.6 | 35,964 | 4.8 | 37,788 | 5.1 |
| 17,334 | | 16,237 | | 19,198 | | 19,036 | | 21,384 | | 22,064 | | 22,335 | |
| 61.3* | | 54.8* | | 61.5* | | 58.0* | | 62.3* | | 62.9* | | 59.1* | |
| 30,063 | 0.1 | 31,600 | 5.1 | 31,588 | 0.0 – | 31,508 | 0.3 – | 32,520 | 3.2 | 32,704 | 0.6 | 32,898 | 0.6 |
| 20,801 | 4.3 | 21,684 | 4.2 | 22,455 | 3.6 | 23,232 | 3.5 | 24,031 | 3.4 | 24,905 | 3.6 | 25,815 | 3.7 |
| 9,262 | | 9,916 | | 9,133 | | 8,276 | | 8,489 | | 7,799 | | 7,083 | |
| 44.5* | | 45.7* | | 40.7* | | 35.6* | | 35.3* | | 31.3* | | 27.4 | |
| 115,993 | 1.6 | 118,643 | 2.3 | 124,598 | 5.0 | 130,418 | 4.7 | 133,853 | 2.6 | 136,182 | 1.7 | 139,834 | 2.7 |
| 83,336 | 3.7 | 86,741 | 4.1 | 90,129 | 3.9 | 93,292 | 3.5 | 96,678 | 3.6 | 100,129 | 3.6 | 101,447 | 1.3 |
| 32,657 | | 31,902 | | 34,469 | | 37,126 | | 37,175 | | 36,053 | | 38,387 | |
| 39.2* | | 36.8* | | 38.2* | | 39.8* | | 38.5* | | 36.0* | | 37.8* | |
| 648,797 | 2.6 | 668,384 | 3.0 | 691,464 | 3.5 | 709,481 | 2.6 | 733,105 | 3.3 | 748,479 | 2.1 | 759,724 | 1.5 |
| 16,412 | | 19,587 | | 23,080 | | 18,017 | | 23,624 | | 15,374 | | 11,245 | |
| 444,763 | 3.6 | 460,608 | 3.6 | 477,569 | 3.7 | 494,612 | 3.6 | 511,475 | 3.4 | 528,738 | 3.4 | 544,239 | 2.9 |
| 15,358 | | 15,845 | | 16,961 | | 17,043 | | 16,863 | | 17,263 | | 15,501 | |
| 204,034 | | 207,776 | | 213,895 | | 214,869 | | 221,630 | | 219,741 | | 215,485 | |
| 45.9 | | 45.1 | | 44.8 | | 43.4 | | 43.3 | | 41.6 | | 39.6 | |

Fig. 2 SUMMER PEAK CAPABILITIES, PEAK LOADS, AND CAPABILITY MARGINS
Total Electric Utility Industry of the Contiguous United States

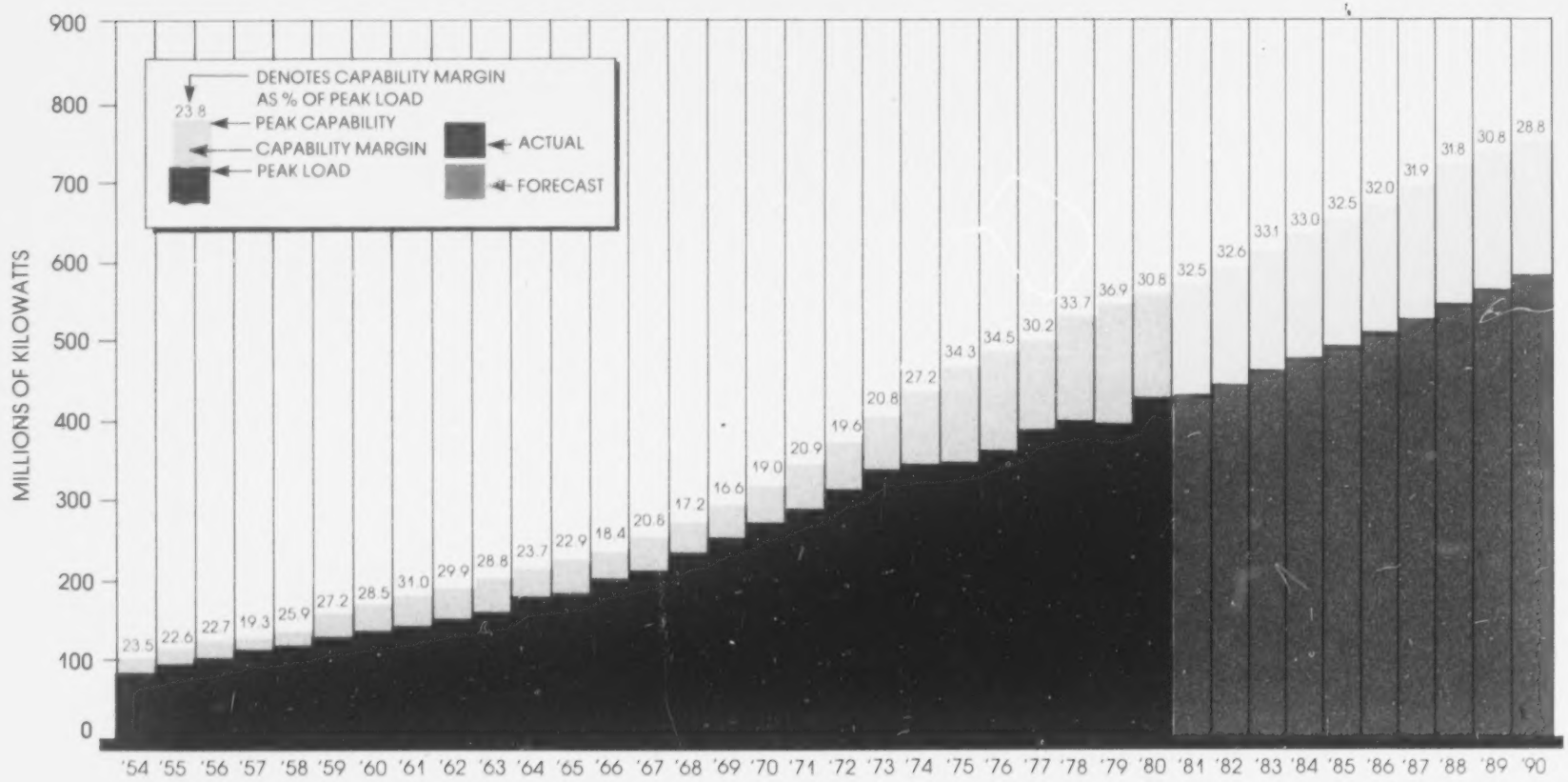
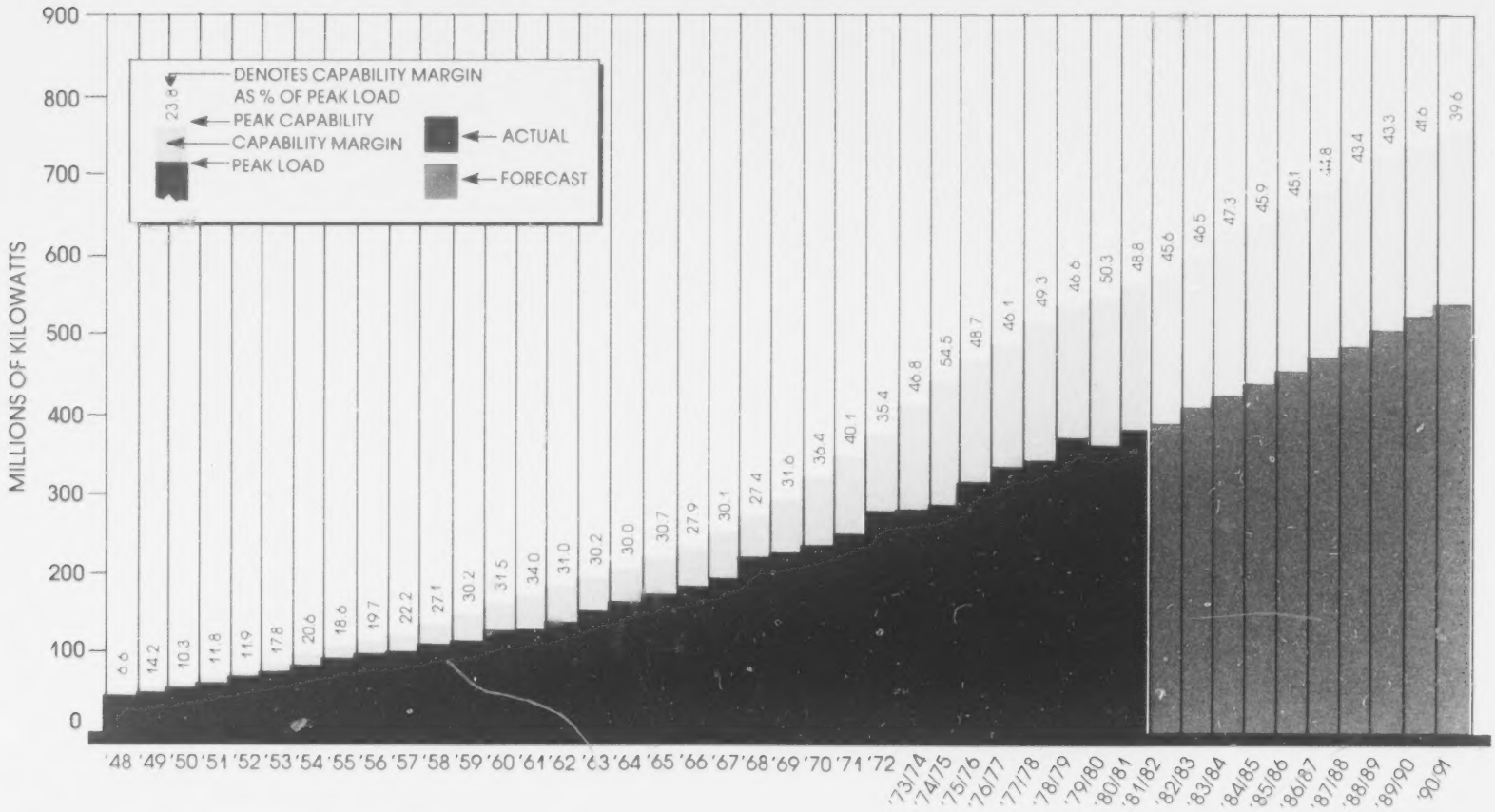


Fig. 3 DECEMBER AND WINTER PEAK CAPABILITIES, PEAK LOADS, AND CAPABILITY MARGINS
Total Electric Utility Industry of the Contiguous United States.



# WINTER PEAK CAPABILITIES, PEAK LOADS, AND CAPABILITY MARGINS

## WINTER CAPABILITIES

The Annual Electric Power Survey of April 1976 was the first report to show data for the turn-of-year, winter season rather than specifically for the month of December. December figures will continue to be shown in Year-End Electric Power Surveys.

The actual winter 1980/81 capability for the sum of the nine regions of the contiguous United States was 572.2 million kilowatts, an increase of 17.7 million kilowatts, or 3.2 percent, above the actual capability at the time of the winter 1979/80 peak.

Winter 1981/82 capability now forecast for the entire electric utility industry under adverse hydro conditions is 581.1 million kilowatts – an increase of 8.9 million kilowatts, or 1.6 percent, over the corresponding winter 1980/81 capability. The new forecasts for 1981/82 through 1989/90 for the nine regions taken together show reduced values, ranging from 2.2 percent to 4.4 percent below the winter capabilities expected for these years twelve months ago.

For winter 1990/91, shown in these surveys for the first time, the total capability of the industry under adverse hydro conditions is forecast to reach 759.7 million kilowatts. This gives an average annual increase for the ten-year period from winter 1980/81 of 2.9 percent.

The total capability of the electric utility industry of the contiguous United States, given herein annually for winter 1980/81 (572.2 million kilowatts) and projected to winter 1990/91 (759.7 million kilowatts), consists of the following types of equipment in approximately the proportions listed below.

**Winter Capability Mix**

| | 1980/81 | 1990/91 |
|---|---|---|
| Conventional Steam Turbine-Generators | 68.2% | 63.1% |
| Nuclear Steam Turbine-Generators | 8.9 | 17.7 |
| Conventional Hydro Generators | 11.4 | 8.8 |
| Pumped-Storage Generators | 2.0 | 2.3 |
| Combustion Turbine-Generators | 8.2 | 6.1 |
| Combined-Cycle Generators | 1.1 | 0.8 |
| Diesel Engine-Generators and others | 0.2 | 1.2 |
| | 100.0% | 100.0% |

Table VIII summarizes the generating capacity additions placed in commercial operation during the first three months of 1981, with the exception of combined-cycle generators, according to the same equipment type classifications as contained in the Capability Mix table. Table IX shows similar data for all scheduled generating additions through 1987 and later.

With December representing winter for the years 1948 through 1972, for the 43-year period shown by the chart in Fig. 3, page 11, for the contiguous United States, the total increase in capability is 705.3 million kilowatts, giving an average annual increase for the entire period of 6.5 percent. As mentioned in the FOREWORD, there is a break in the series between 1978 and 1979.

## WINTER PEAK LOADS

According to actual operating records now available, the winter 1980/81 peak load for the sum of the nine regions of the contiguous United States was 384.6 million kilowatts – 15.7 million kilowatts, or 4.3 percent, above the winter 1979/80 peak load.

As now forecast, the winter 1981/82 peak load for the country will reach 399.0 million kilowatts, an increase of 3.7 percent over the winter 1980/81 peak load. For winter 1990/91, shown in these surveys for the first time, the forecast peak load is 544.2 million kilowatts. This represents an average annual increase during the ten-year period from winter 1980/81 of 3.5 percent.

## WINTER CAPABILITY MARGINS

Compared with winter capability margins forecast one year ago, regional winter margins reported in this survey are generally higher for NPCC, MAAC, ECAR, SERC and MAIN, lower for SPP, ERCOT, MARCA & WSCC. For the country as a whole, capability margins are now forecast to range from 47.3 percent for the winter of 1983/84 to 39.6 percent for 1990/91, shown in these surveys for the first time.

# RELATIONSHIP BETWEEN SUMMER AND WINTER PEAK LOADS

The relationship between the summer and winter peak loads in the different regions of the country, and also for the contiguous United States, are shown in Table III, where the summer peak load in each case is expressed as a percentage of the winter peak load for the following season.

In those regions where the summer peak load has been characteristically higher than the peak during the following winter, the percentage figure has, expectedly, been above 100 percent. This has been true in particular in SPP and ERCOT, where, due to climatic conditions, heavy air conditioning loads during the summer months have caused peaks that far exceed those during the following winter.

In these regions it has not been possible to develop electric heating loads during the winter months to offset the heavy air conditioning load in summer.

From the 1950s through the early 1970s there was a gradual trend in most regions for the summer peak load to approach and then exceed the peak of the following winter. 1963 was the last year in which the country as a whole experienced a summer peak that was about the same as the winter peak load. During the years 1964 through 1971, apart from a slight exception due to a cool summer peak period in 1967, there was a departure from the equality of summer and winter peaks experienced in the early 1960s. Since 1964 summer peaks have generally exceeded the peaks for the following winter by increasing amounts. In 1970, and again in 1971, apparently normal summer peaks were followed by winter peaks depressed both by mild weather and reduced industrial loads. This combination produced summer to winter peak relationships of 111 percent and 112 percent respectively in 1970 and 1971.

After falling back to 110 percent in 1972, the summer/winter ratio jumped to a high of 117 percent in 1973 because of the unprecedented drop in the winter peak load from the year previous. The ratio lowered only one point in 1974 since both the summer and winter peak loads were little changed from those experienced in 1973. The relationship between the summer and winter peaks dropped back to more normal values of 108 percent and 106 percent, respectively, in 1975 and 1976. This was followed by a rise to 110 percent in 1977, a decline to 107 percent in 1978, and an uptick to 108 percent in 1979. The hot summer of 1980 helped to produce a value of 111 percent. The forecast now projects a constant 108 percent from 1981 to 1984, followed by a six-year plateau at 107 percent through 1990.

## Table III SUMMER PEAK LOADS EXPRESSED AS PERCENTAGE OF PEAK LOAD FOR THE FOLLOWING WINTER

| | ACTUAL | | | | | | | | FORECAST | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Regions | 73/74 | 74/75 | 75/76 | 76/77 | 77/78 | 78/79 | 79/80 | 80/81 | 81/82 | 82/83 | 83/84 | 84/85 | 85/86 | 86/87 | 87/88 | 88/89 | 89/90 | 90/91 |
| NPCC | 111 | 104 | 102 | 96 | 105 | 102 | 100 | 104 | 101 | 101 | 101 | 100 | 100 | 100 | 99 | 99 | 99 | 99 |
| MAAC | 133 | 123 | 114 | 108 | 115 | 111 | 114 | 116 | 113 | 113 | 112 | 111 | 111 | 110 | 109 | 109 | 108 | 108 |
| ECAR | 112 | 105 | 102 | 97 | 101 | 99 | 104 | 101 | 98 | 97 | 98 | 98 | 98 | 97 | 97 | 97 | 97 | 97 |
| SERC | 106 | 109 | 100 | 93 | 99 | 99 | 101 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 100 | 100 | 100 | 101 |
| MAIN | 133 | 125 | 119 | 122 | 122 | 118 | 123 | 127 | 122 | 122 | 120 | 120 | 119 | 118 | 117 | 116 | 115 | 115 |
| SPP | 143 | 156 | 124 | 144 | 144 | 138 | 133 | 147 | 135 | 136 | 136 | 136 | 136 | 135 | 135 | 135 | 135 | 135 |
| ERCOT | 149 | 157 | 141 | 142 | 148 | 134 | 130 | 132 | 133 | 134 | 134 | 133 | 133 | 132 | 131 | 131 | 131 | 130 |
| MARCA | 125 | 119 | 106 | 103 | 111 | 111 | 105 | 111 | 109 | 109 | 109 | 109 | 108 | 108 | 108 | 108 | 108 | 108 |
| WSCC | 104 | 107 | 104 | 107 | 105 | 98 | 100 | 117 | 102 | 102 | 102 | 102 | 101 | 101 | 101 | 101 | 101 | 103 |
| Total Electric Utility Industry of the Contiguous United States | 117 | 116 | 108 | 106 | 110 | 107 | 108 | 111 | 108 | 108 | 108 | 108 | 107 | 107 | 107 | 107 | 107 | 107 |

# KILOWATT-HOUR REQUIREMENTS AND ANNUAL LOAD FACTORS

Calendar-year kilowatt-hour requirements by region and for the total of the lower forty-eight states are shown in Table IV. The corresponding annual load factors are given in Table V. The kilowatt-hour requirement represents utility generation plus kilowatt-hours received from all outside sources, including net imports from other countries and energy from certain industrial installations which are interconnected and coordinated with the utility systems.

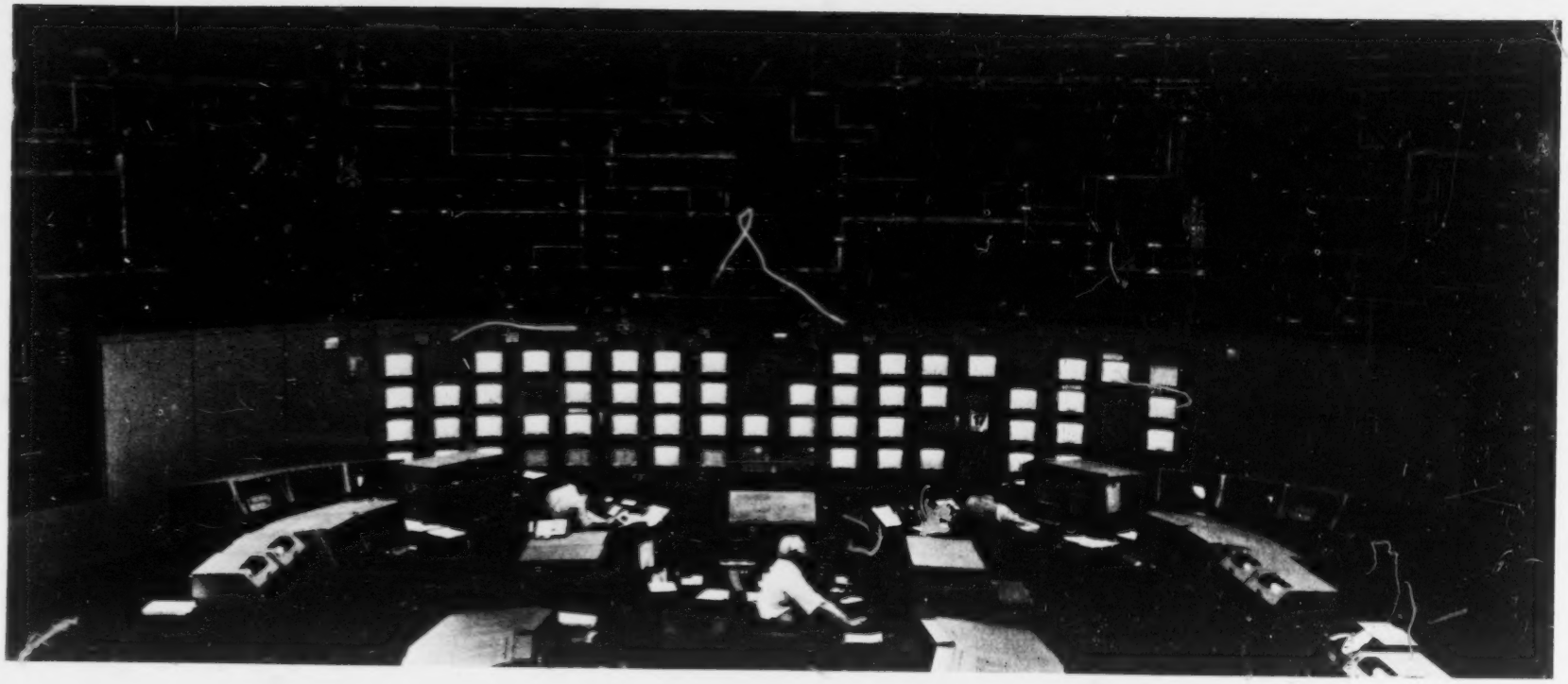
The present forecasts of kilowatt-hour requirements for the contiguous United States for the years 1981 through 1989 range between 4.2 and 6.9 percent below the values predicted in the previous survey of April 1, 1980. For 1990, shown in these surveys for the first time, the projected kilowatt-hour requirement is 3.2 trillion kilowatt-hours. The average annual increase in kilowatt-hour requirements during the ten-year period 1981 through 1990, according to present forecasts, is 3.5 percent.

Fig. 4, Page 17, is a bar chart showing the total annual kilowatt-hour requirements for the entire industry, starting with the year 1948 and including the forecasts for the years 1981 through 1990. Annual load factors are printed at the top of each bar. The average annual increase in kwhr requirements for the entire period shown in Fig. 4 is 6.1 percent.

## Table IV ANNUAL KILOWATT-HOUR REQUIREMENTS – MILLIONS as of April 1, 1981

| Regions | 1979* | 1980* | % Inc | 1981 | % Inc | 1982 | % Inc | 1983 | % Inc | 1984 | % Inc |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | 201,708 | 203,954 | 1.1 | 203,460 | 0.2 – | 206,840 | 1.7 | 210,868 | 1.9 | 216,075 | 2.5 |
| MAAC | 171,567 | 175,622 | 2.4 | 175,930 | 0.2 | 182,822 | 3.9 | 188,702 | 3.2 | 194,706 | 3.2 |
| ECAR | 379,018 | 366,198 | 3.4 – | 378,300 | 3.3 | 397,000 | 4.9 | 414,700 | 4.5 | 429,500 | 3.6 |
| SERC | 459,420 | 479,715 | 4.4 | 479,939 | 0.0 | 500,406 | 4.3 | 522,167 | 4.3 | 540,966 | 3.6 |
| MAIN | 171,052 | 166,116 | 2.9 – | 169,292 | 1.9 | 175,250 | 3.5 | 180,809 | 3.2 | 187,253 | 3.6 |
| SPP | 191,762 | 213,381 | 11.3 | 214,935 | 0.7 | 224,431 | 4.4 | 233,248 | 3.9 | 243,337 | 4.3 |
| ERCOT | 150,533 | 162,327 | 7.8 | 167,469 | 3.2 | 176,810 | 5.6 | 185,018 | 4.6 | 193,683 | 4.7 |
| MARCA | 96,518 | 96,422 | 0.1 – | 101,052 | 4.8 | 106,648 | 5.5 | 111,516 | 4.6 | 116,492 | 4.5 |
| WSCC | 425,349 | 428,983 | 0.9 | 449,754 | 4.8 | 458,895 | 2.0 | 475,396 | 3.6 | 493,214 | 3.7 |
| Survey Totals for the Nine Regions | 2,246,927 | 2,292,718 | 2.0 | 2,340,131 | 2.1 | 2,429,102 | 3.8 | 2,522,424 | 3.8 | 2,615,226 | 3.7 |
| Annual Increase | | 45,791 | | 47,413 | | 88,971 | | 93,322 | | 92,802 | |

*Actual

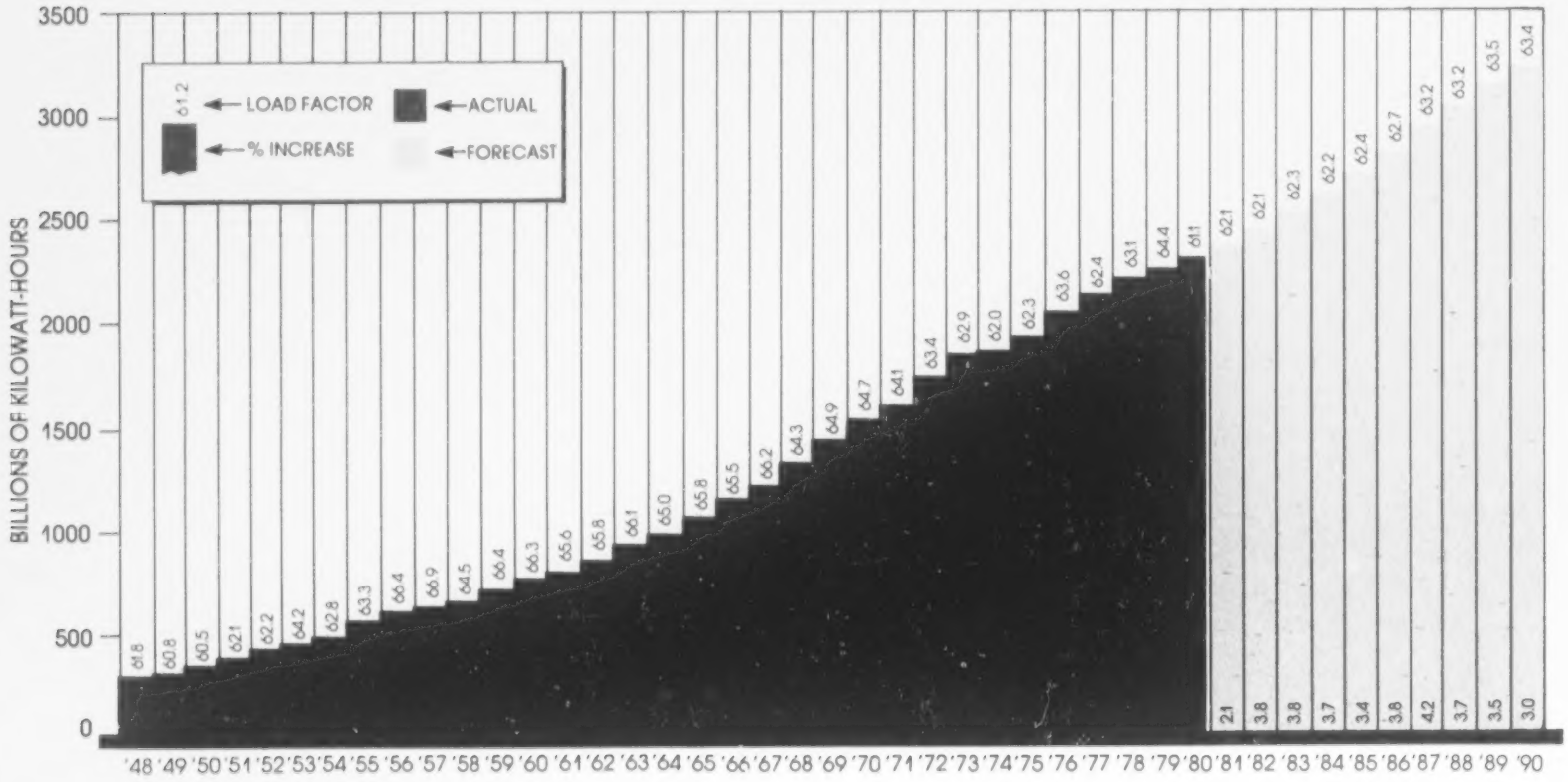


| 1985 | % Inc | 1986 | % Inc | 1987 | % Inc | 1988 | % Inc | 1989 | % Inc | 1990 | % Inc |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 221,162 | 2.4 | 226,258 | 2.3 | 231,317 | 2.2 | 236,594 | 2.3 | 241,994 | 2.3 | 247,557 | 2.3 |
| 200,502 | 3.0 | 206,241 | 2.9 | 211,922 | 2.8 | 218,195 | 3.0 | 224,750 | 3.0 | 230,713 | 2.7 |
| 441,600 | 2.8 | 456,800 | 3.4 | 472,600 | 3.5 | 491,500 | 4.0 | 508,800 | 3.5 | 522,400 | 2.7 |
| 561,252 | 3.7 | 585,383 | 4.3 | 612,020 | 4.6 | 633,589 | 3.5 | 654,718 | 3.3 | 676,690 | 3.4 |
| 193,457 | 3.3 | 200,010 | 3.4 | 206,654 | 3.3 | 213,540 | 3.3 | 220,424 | 3.2 | 227,605 | 3.3 |
| 253,376 | 4.1 | 264,389 | 4.3 | 275,425 | 4.2 | 287,294 | 4.3 | 297,776 | 3.6 | 310,539 | 4.3 |
| 203,087 | 4.9 | 212,514 | 4.6 | 222,864 | 4.9 | 233,263 | 4.7 | 243,542 | 4.4 | 253,504 | 4.1 |
| 121,850 | 4.6 | 126,577 | 3.9 | 131,211 | 3.7 | 135,736 | 3.4 | 140,516 | 3.5 | 145,920 | 3.8 |
| 508,446 | 3.1 | 530,670 | 4.4 | 562,818 | 6.1 | 586,798 | 4.3 | 608,811 | 3.8 | 621,145 | 2.0 |
| 2,704,732 | 3.4 | 2,808,842 | 3.8 | 2,926,831 | 4.2 | 3,036,509 | 3.7 | 3,141,331 | 3.5 | 3,236,073 | 3.0 |
| 89,506 | | 104,110 | | 117,989 | | 109,678 | | 104,822 | | 94,742 | |

## Table V ANNUAL LOAD FACTORS, %

| | ACTUAL | | FORECAST | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Regions | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
| NPCC | 66.4 | 63.0 | 64.6 | 64.6 | 64.7 | 64.9 | 65.5 | 65.7 | 65.6 | 65.4 | 65.5 | 65.5 |
| MAAC | 61.6 | 57.9 | 59.3 | 59.8 | 60.2 | 60.4 | 61.0 | 61.3 | 61.6 | 62.0 | 62.8 | 63.1 |
| ECAR | 70.1 | 66.2 | 66.3 | 66.6 | 66.8 | 66.8 | 66.8 | 66.7 | 66.4 | 66.4 | 67.0 | 66.7 |
| SERC | 63.0 | 60.4 | 61.0 | 61.2 | 61.8 | 61.8 | 62.1 | 62.3 | 62.9 | 62.9 | 63.1 | 63.0 |
| MAIN | 57.9 | 55.8 | 55.4 | 55.5 | 55.6 | 55.9 | 56.2 | 56.5 | 56.7 | 56.8 | 57.2 | 57.4 |
| SPP | 58.2 | 54.0 | 55.7 | 55.7 | 55.7 | 55.5 | 55.8 | 56.0 | 56.3 | 56.4 | 56.5 | 56.7 |
| ERCOT | 61.8 | 58.3 | 58.4 | 58.6 | 58.8 | 58.5 | 58.8 | 58.7 | 59.0 | 58.9 | 59.0 | 59.1 |
| MARCA | 60.8 | 56.6 | 57.9 | 58.3 | 58.5 | 58.5 | 59.3 | 59.5 | 59.7 | 59.5 | 59.8 | 60.0 |
| WSCC | 69.5 | 67.0 | 67.0 | 66.0 | 66.3 | 66.0 | 66.0 | 66.7 | 68.4 | 68.5 | 68.7 | 67.9 |
| Survey Totals for the Nine Regions | 64.4 | 61.1 | 62.1 | 62.1 | 62.3 | 62.2 | 62.4 | 62.7 | 63.2 | 63.2 | 63.5 | 63.4 |

Fig. 4 ANNUAL KILOWATT-HOUR REQUIREMENTS AND ANNUAL LOAD FACTORS
Total Electric Utility Industry of the Contiguous United States



# COMPARISON WITH PREVIOUS FUEL SURVEY

## Comparison of 1981-89 Kilowatt-Hour Projections by Source, Fuels and Hydro, in April 1980 and April 1981 Electric Power Surveys

The expected relative percent share of total net generation for coal has increased from 50.5 to 51.2 percent for 1981, increased from 50.9 to 51.8 percent for 1982, and at 51.0 percent of total in 1985 is one full percentage point higher than in the April 1980 Survey. Shown for the first time in these surveys, the expected percent share for coal in 1990 is 52.7 percent.

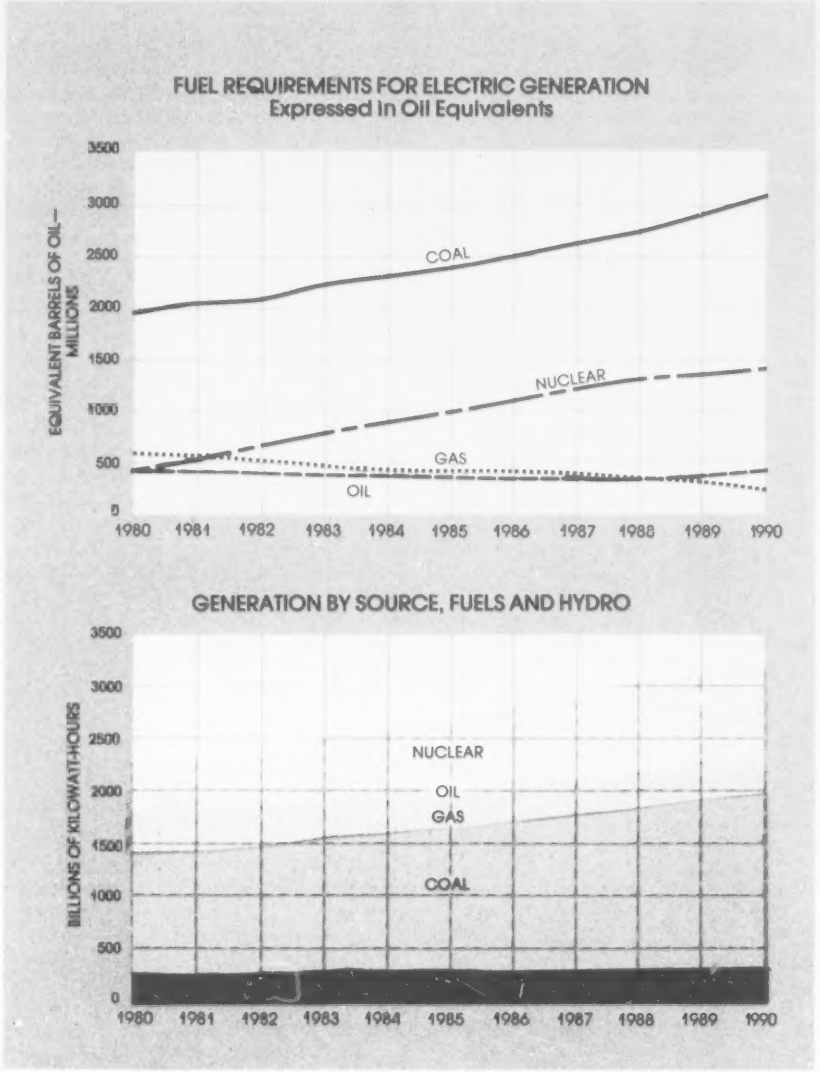
While the percent share of generation accounted for by gas has a downward trend similar to that forecast a year ago, the annual percentages now start from a higher point. Projected percent share for gas for 1981 has been increased from 10.6 to 14.0 percent, has risen from 9.2 to 12.3 percent for 1982, and has gone up from 7.9 to 9.3 percent for 1985. A decline to 4.9 percent is shown by 1990.

Projected percent share for oil dropped from 14.1 to 10.7 percent for 1981, declined from 13.6 to 9.9 percent for 1982, and has been reduced from 10.6 to 8.1 percent for 1985. A drop to 8.1 percent is shown for 1990. These lower shares of total generation expected from oil derive at least partially from the greater availability of gas now forecast, compared to a year ago.

The new projections of generation from nuclear sources for the period 1981–89 are all reduced from those forecast one year ago. The expectation for the 1981 share has dropped from 15.1 to 13.2 percent, from 16.9 to 15.8 percent for 1982, and from 23.1 to 21.5 percent for 1985. Nuclear is now forecast to account for 25.5 percent of total net generation by 1990.

While increasing slightly over the period in terms of actual kilowatt-hours generated, hydro is expected to account for 10.7 percent of total net generation in 1981 and drop to 8.3 percent by 1990.

During the period 1981–1990, generation from other sources ranges from 0.6 to 1.4 percent and pumping energy deductions range between 0.6 and 0.8 percent.



## Table VI FOSSIL FUEL REQUIREMENTS FOR ELECTRIC GENERATION IN PHYSICAL UNITS, CONTIGUOUS U.S.

| | 1980 Actual | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GROSS COAL REQUIREMENTS IN PHYSICAL UNITS – (Thousands of Tons) | | | | | | | | | | | |
| NPCC | 10,312 | 10,340 | 13,404 | 15,690 | 18,069 | 21,372 | 23,848 | 25,158 | 26,539 | 27,705 | 28,727 |
| MAAC | 36,533 | 35,074 | 34,744 | 36,331 | 38,521 | 37,969 | 38,295 | 37,908 | 39,616 | 41,210 | 41,118 |
| ECAR | 152,683 | 156,367 | 162,465 | 167,917 | 166,878 | 167,482 | 172,723 | 175,682 | 181,841 | 187,059 | 190,889 |
| SERC | 121,528 | 112,180 | 115,214 | 119,897 | 120,414 | 124,994 | 128,236 | 134,943 | 132,759 | 137,225 | 138,971 |
| MAIN | 58,676 | 60,441 | 61,878 | 59,270 | 58,333 | 58,598 | 60,002 | 61,659 | 62,290 | 63,727 | 65,930 |
| SPP | 35,799 | 45,125 | 54,823 | 62,098 | 65,033 | 73,103 | 78,503 | 84,904 | 92,850 | 99,764 | 114,659 |
| ERCOT | 39,252 | 42,493 | 47,320 | 48,458 | 48,787 | 51,240 | 55,064 | 63,883 | 71,447 | 81,348 | 93,595 |
| MARCA | 42,778 | 47,223 | 49,647 | 53,194 | 57,668 | 59,029 | 64,111 | 66,279 | 69,893 | 73,617 | 76,256 |
| WSCC | 65,931 | 75,411 | 80,644 | 82,067 | 86,596 | 90,696 | 95,328 | 102,885 | 111,560 | 122,582 | 130,660 |
| TOTAL | 563,492 | 584,654 | 620,139 | 644,922 | 660,299 | 684,483 | 716,110 | 753,301 | 788,795 | 834,237 | 880,805 |
| GROSS OIL REQUIREMENTS IN PHYSICAL UNITS – (Thousands of Barrels) | | | | | | | | | | | |
| NPCC | 141,091 | 138,987 | 133,980 | 123,232 | 114,186 | 99,196 | 89,435 | 77,374 | 70,471 | 81,965 | 82,519 |
| MAAC | 52,873 | 34,848 | 32,857 | 26,123 | 31,493 | 35,185 | 38,618 | 31,388 | 29,886 | 29,301 | 33,504 |
| ECAR | 21,742 | 25,607 | 27,601 | 29,292 | 29,377 | 29,377 | 29,311 | 29,311 | 29,192 | 29,285 | 29,100 |
| SERC | 93,558 | 93,739 | 92,749 | 76,994 | 75,725 | 68,731 | 76,666 | 78,742 | 77,862 | 82,653 | 87,408 |
| MAIN | 14,494 | 16,619 | 14,470 | 14,581 | 13,493 | 13,807 | 9,048 | 7,260 | 7,641 | 10,377 | 12,324 |
| SPP | 17,807 | 6,163 | 6,278 | 5,046 | 7,234 | 12,929 | 20,597 | 38,711 | 36,539 | 31,304 | 46,974 |
| ERCOT | 1,610 | 2,132 | 8,746 | 12,752 | 19,783 | 17,660 | 20,055 | 6,715 | 11,890 | 6,137 | 36,977 |
| MARCA | 1,002 | 1,696 | 1,348 | 1,286 | 1,559 | 1,723 | 2,237 | 2,201 | 2,120 | 1,982 | 2,830 |
| WSCC | 67,389 | 99,819 | 84,113 | 92,045 | 90,729 | 90,944 | 74,494 | 78,764 | 93,764 | 104,237 | 110,759 |
| TOTAL | 411,566 | 419,610 | 402,142 | 381,351 | 383,579 | 369,552 | 360,461 | 350,466 | 359,365 | 377,241 | 442,395 |
| GROSS GAS REQUIREMENTS IN PHYSICAL UNITS – (Millions of Cubic Feet) | | | | | | | | | | | |
| NPCC | 140,655 | 102,376 | 29,700 | 29,200 | – | – | – | – | – | – | – |
| MAAC | 96,230 | 87,354 | 55,335 | 46,051 | 46,431 | 48,670 | 27,171 | 25,590 | 25,377 | 25,474 | 21,378 |
| ECAR | 5,358 | 7,380 | 7,198 | 7,232 | 6,758 | 6,758 | 6,758 | 6,758 | 6,758 | 6,758 | 6,758 |
| SERC | 181,419 | 159,108 | 146,147 | 141,463 | 126,523 | 113,908 | 81,266 | 70,766 | 42,264 | 25,788 | 24,990 |
| MAIN | 28,082 | 21,741 | 19,478 | 3,446 | 2,747 | 1,928 | 1,909 | 2,091 | 2,334 | 2,545 | 2,835 |
| SPP | 1,285,042 | 1,237,199 | 1,128,672 | 1,047,022 | 1,023,820 | 967,820 | 897,744 | 821,209 | 750,035 | 730,779 | 598,223 |
| ERCOT | 1,111,539 | 1,108,468 | 1,015,808 | 1,006,771 | 948,919 | 971,773 | 960,189 | 965,101 | 930,004 | 911,193 | 639,072 |
| MARCA | 14,529 | 4,238 | 2,023 | 1,738 | 1,665 | 1,328 | 1,591 | 1,620 | 2,357 | 3,017 | 3,645 |
| WSCC | 632,573 | 643,025 | 616,691 | 511,462 | 473,742 | 465,784 | 567,187 | 528,156 | 374,188 | 290,743 | 208,085 |
| TOTAL | 3,495,427 | 3,370,889 | 3,021,052 | 2,794,385 | 2,630,605 | 2,577,969 | 2,543,815 | 2,421,291 | 2,133,317 | 2,016,297 | 1,505,496 |

## Table VII NET GENERATION BY SOURCE, FUELS AND HYDRO – MILLIONS OF KILOWATT-HOURS

| | 1980 Actual | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NPCC** | | | | | | | | | | | |
| Coal | 24,147 | 25,027 | 32,554 | 38,342 | 44,945 | 53,365 | 59,610 | 62,114 | 65,741 | 68,360 | 70,981 |
| Oil | 83,800 | 82,379 | 79,401 | 72,287 | 66,748 | 58,008 | 52,393 | 45,454 | 41,356 | 48,980 | 49,206 |
| Gas | 12,427 | 9,032 | 2,637 | 2,610 | – | – | – | – | – | – | – |
| Nuclear | 41,889 | 47,658 | 52,710 | 57,890 | 60,120 | 65,390 | 70,520 | 80,100 | 85,860 | 87,310 | 89,570 |
| Hydro, adverse conditions | 34,454 | 30,755 | 30,936 | 31,278 | 31,439 | 31,563 | 31,666 | 32,530 | 33,269 | 33,477 | 33,940 |
| Other | 66 | 120 | 183 | 183 | 373 | 474 | 512 | 708 | 829 | 829 | 1,034 |
| Pumping Energy (deduct) | 5,117 – | 3,518 – | 3,652 – | 3,804 – | 3,946 – | 4,086 – | 4,106 – | 5,251 – | 6,122 – | 6,322 – | 6,583 – |
| Total Net Generation | 191,666 | 191,453 | 194,769 | 198,786 | 199,679 | 204,714 | 210,595 | 215,656 | 220,931 | 232,634 | 238,198 |
| **MAAC** | | | | | | | | | | | |
| Coal | 88,446 | 84,963 | 84,208 | 88,308 | 93,856 | 92,360 | 93,168 | 92,185 | 96,[illegible] | 100,264 | 100,495 |
| Oil | 27,837 | 19,392 | 18,556 | 14,362 | 17,433 | 20,205 | 22,644 | 17,356 | 16,750 | 19,675 | 18,519 |
| Gas | 8,224 | 8,202 | 5,530 | 4,337 | 4,482 | 4,295 | 2,680 | 2,585 | 2,229 | 2,312 | 2,298 |
| Nuclear | 30,037 | 35,640 | 50,959 | 59,168 | 56,391 | 62,008 | 66,158 | 78,358 | 84,100 | 83,870 | 89,883 |
| Hydro, adverse conditions | 4,418 | 5,429 | 5,826 | 5,994 | 5,962 | 5,984 | 6,126 | 6,248 | 6,356 | 6,247 | 6,309 |
| Other | 584 | 459 | 460 | 455 | 460 | 463 | 392 | – | – | – | – |
| Pumping Energy (deduct) | 2,535 – | 2,623 – | 3,191 – | 3,428 – | 3,383 – | 3,313 – | 3,287 – | 3,456 – | 3,612 – | 3,459 – | 3,543 – |
| Total Net Generation | 157,011 | 152,462 | 162,348 | 169,196 | 175,201 | 182,002 | 187,881 | 193,276 | 202,347 | 208,909 | 213,961 |
| **ECAR** | | | | | | | | | | | |
| Coal | 337,780 | 344,422 | 357,853 | 369,861 | 367,572 | 368,903 | 380,446 | 386,964 | 400,531 | 412,004 | 420,441 |
| Oil | 16,014 | 14,865 | 16,122 | 17,192 | 17,232 | 17,232 | 17,190 | 17,190 | 17,098 | 17,141 | 17,024 |
| Gas | 545 | 586 | 572 | 575 | 525 | 525 | 525 | 525 | 525 | 525 | 525 |
| Nuclear | 18,620 | 20,351 | 23,917 | 28,007 | 44,466 | 55,235 | 57,754 | 67,255 | 73,594 | 79,274 | 85,574 |
| Hydro, adverse conditions | 3,866 | 3,698 | 3,698 | 3,742 | 3,786 | 3,786 | 4,311 | 4,749 | 4,749 | 4,749 | 4,749 |
| Other | – | – | – | – | – | – | – | – | – | – | – |
| Pumping Energy (deduct) | 3,235 – | 3,049 – | 3,049 – | 3,049 – | 3,049 – | 3,049 – | 3,596 – | 4,144 – | 4,144 – | 4,144 – | 4,144 – |
| Total Net Generation | 373,590 | 380,873 | 399,113 | 416,328 | 430,532 | 442,632 | 456,630 | 472,539 | 492,353 | 509,569 | 524,169 |
| **SERC** | | | | | | | | | | | |
| Coal | 282,363 | 271,965 | 275,208 | 284,010 | 288,665 | 297,000 | 304,777 | 320,179 | 316,753 | 325,601 | 331,249 |
| Oil | 55,156 | 55,930 | 55,946 | 46,876 | 46,337 | 41,059 | 46,010 | 47,820 | 46,956 | 50,135 | 53,395 |
| Gas | 16,402 | 14,250 | 13,131 | 12,867 | 11,497 | 10,189 | 7,475 | 6,505 | 3,506 | 2,016 | 2,136 |
| Nuclear | 82,979 | 104,139 | 124,921 | 143,307 | 158,576 | 173,260 | 190,223 | 196,460 | 223,311 | 232,736 | 247,614 |
| Hydro, adverse conditions | 36,359 | 33,275 | 33,476 | 34,068 | 33,952 | 34,676 | 35,817 | 36,979 | 37,746 | 37,826 | 38,487 |
| Other | 538 | 1,398 | 869 | 763 | 1,023 | 2,359 | 766 | 2,333 | 774 | 1,351 | 581 |
| Pumping Energy (deduct) | 3,295 – | 2,752 – | 3,027 – | 3,661 – | 3,455 – | 3,887 – | 4,980 – | 6,470 – | 7,474 – | 7,572 – | 8,419 – |
| Total Net Generation | 470,502 | 478,206 | 500,524 | 518,230 | 536,595 | 554,656 | 580,088 | 603,806 | 621,572 | 643,033 | 665,043 |
| **MAIN** | | | | | | | | | | | |
| Coal | 114,436 | 118,150 | 120,663 | 114,920 | 113,783 | 113,944 | 116,896 | 118,349 | 118,985 | 121,518 | 125,133 |
| Oil | 7,387 | 8,231 | 7,305 | 7,227 | 6,703 | 6,839 | 4,189 | 3,126 | 3,396 | 4,760 | 5,769 |
| Gas | 1,831 | 1,567 | 1,136 | 202 | 158 | 98 | 97 | 112 | 130 | 146 | 166 |
| Nuclear | 35,668 | 36,322 | 41,679 | 57,583 | 68,506 | 73,545 | 79,152 | 84,962 | 91,006 | 91,978 | 92,985 |
| Hydro, adverse conditions | 2,411 | 2,300 | 2,317 | 2,280 | 2,289 | 2,305 | 2,342 | 2,327 | 2,358 | 2,396 | 2,373 |
| Other | 257 | 351 | 358 | 332 | 338 | 336 | 334 | 334 | 336 | 324 | 327 |
| Pumping Energy (deduct) | 65 – | 186 – | 220 – | 133 – | 159 – | 193 – | 273 – | 244 – | 305 – | 386 – | 339 – |
| Total Net Generation | 161,925 | 166,735 | 173,238 | 182,411 | 191,618 | 196,874 | 202,737 | 208,966 | 215,906 | 220,736 | 226,414 |

# Table VII NET GENERATION BY SOURCE, FUELS AND HYDRO – MILLIONS OF KILOWATT-HOURS

| | 1980 Actual | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SPP** | | | | | | | | | | | |
| Coal | 60,551 | 73,942 | 89,904 | 101,050 | 104,397 | 114,290 | 121,369 | 131,077 | 142,354 | 154,154 | 171,411 |
| Oil | 10,830 | 3,504 | 3,340 | 2,576 | 3,941 | 7,467 | 12,280 | 23,120 | 21,667 | 18,507 | 25,661 |
| Gas | 120,999 | 117,589 | 109,213 | 99,330 | 96,399 | 90,879 | 85,108 | 77,392 | 71,699 | 70,802 | 58,653 |
| Nuclear | 7,831 | 9,031 | 15,333 | 20,940 | 30,626 | 32,047 | 35,953 | 34,869 | 41,186 | 42,135 | 41,489 |
| Hydro, adverse conditions | 3,898 | 5,180 | 5,350 | 5,540 | 5,641 | 5,654 | 5,654 | 5,654 | 5,655 | 5,655 | 5,655 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pumping Energy (deduct) | 340– | 500– | 500– | 660– | 750– | 750– | 750– | 750– | 750– | 750– | 750– |
| Total Net Generation | 203,769 | 208,746 | 222,640 | 228,776 | 240,254 | 250,087 | 259,614 | 271,362 | 281,811 | 290,503 | 303,119 |
| **ERCOT** | | | | | | | | | | | |
| Coal | 51,631 | 56,470 | 62,525 | 65,104 | 65,512 | 68,845 | 73,767 | 85,317 | 94,110 | 105,581 | 120,076 |
| Oil | 524 | 731 | 3,572 | 7,212 | 11,602 | 9,595 | 11,403 | 2,872 | 5,791 | 2,137 | 20,142 |
| Gas | 109,052 | 107,728 | 99,946 | 98,301 | 91,944 | 93,859 | 92,220 | 98,386 | 93,950 | 96,625 | 72,805 |
| Nuclear | – | – | 2,651 | 5,898 | 16,336 | 20,152 | 26,953 | 29,556 | 32,942 | 36,545 | 37,683 |
| Hydro, adverse conditions | 348 | 291 | 291 | 291 | 291 | 291 | 291 | 291 | 291 | 291 | 291 |
| Other | – | – | – | – | – | – | – | – | – | – | – |
| Pumping Energy (deduct) | – | – | – | – | – | – | – | – | – | – | – |
| Total Net Generation | 161,555 | 165,220 | 168,985 | 176,806 | 185,685 | 192,742 | 204,634 | 216,422 | 227,084 | 241,179 | 250,997 |
| **MARCA** | | | | | | | | | | | |
| Coal | 65,062 | 70,064 | 73,572 | 79,515 | 83,456 | 87,711 | 92,984 | 97,535 | 100,934 | 106,581 | 110,801 |
| Oil | 325 | 706 | 521 | 533 | 705 | 790 | 882 | 822 | 865 | 824 | 1,290 |
| Gas | 1,099 | 287 | 167 | 136 | 135 | 111 | 141 | 146 | 211 | 277 | 338 |
| Nuclear | 20,581 | 22,919 | 25,667 | 24,950 | 24,204 | 25,547 | 24,751 | 24,247 | 25,729 | 25,041 | 24,274 |
| Hydro, adverse conditions | 13,273 | 12,872 | 12,822 | 12,918 | 13,053 | 13,086 | 13,317 | 13,318 | 13,350 | 13,360 | 13,360 |
| Other | – | – | – | – | – | – | – | – | – | – | – |
| Pumping Energy (deduct) | – | – | – | – | – | – | – | – | – | – | – |
| Total Net Generation | 100,340 | 106,848 | 112,749 | 118,052 | 121,553 | 127,245 | 132,075 | 136,068 | 141,089 | 146,083 | 150,063 |
| **WSCC** | | | | | | | | | | | |
| Coal | 114,999 | 133,319 | 141,934 | 144,825 | 153,134 | 160,470 | 168,329 | 181,626 | 198,004 | 216,595 | 233,184 |
| Oil | 42,304 | 60,874 | 51,257 | 53,692 | 52,957 | 53,166 | 42,407 | 45,245 | 55,239 | 61,720 | 65,766 |
| Gas | 64,252 | 63,425 | 61,035 | 50,486 | 46,671 | 46,007 | 56,459 | 52,348 | 36,636 | 28,142 | 19,900 |
| Nuclear | 13,937 | 25,496 | 41,618 | 48,185 | 58,032 | 63,169 | 77,469 | 93,102 | 101,033 | 101,567 | 103,518 |
| Hydro, adverse conditions | 186,034 | 151,666 | 149,576 | 155,449 | 157,330 | 156,198 | 154,710 | 157,770 | 158,027 | 160,496 | 158,572 |
| Other | 6,654 | 14,896 | 13,541 | 23,260 | 25,408 | 29,010 | 30,797 | 32,105 | 37,382 | 39,904 | 40,261 |
| Pumping Energy (deduct) | 912– | 766– | 736– | 851– | 813– | 888– | 815– | 892– | 837– | 927– | 1,370– |
| Total Net Generation | 427,268 | 448,910 | 458,225 | 475,046 | 492,719 | 507,132 | 529,356 | 561,504 | 585,484 | 607,497 | 619,831 |
| **TOTAL** | | | | | | | | | | | |
| Coal | 1,139,415 | 1,178,322 | 1,238,421 | 1,285,935 | 1,315,320 | 1,356,888 | 1,411,346 | 1,475,546 | 1,533,936 | 1,610,678 | 1,683,771 |
| Oil | 244,177 | 246,612 | 230,020 | 221,957 | 223,658 | 214,361 | 209,398 | 203,005 | 209,118 | 223,779 | 257,772 |
| Gas | 334,831 | 322,666 | 293,367 | 268,844 | 251,811 | 245,963 | 244,705 | 237,999 | 208,886 | 200,865 | 156,821 |
| Nuclear | 251,542 | 302,556 | 379,455 | 445,928 | 517,257 | 570,853 | 628,733 | 688,909 | 758,761 | 781,476 | 812,590 |
| Hydro, adverse conditions | 285,061 | 245,466 | 244,292 | 251,560 | 253,743 | 253,543 | 254,234 | 259,866 | 261,801 | 264,497 | 263,736 |
| Other | 8,099 | 17,224 | 15,411 | 24,993 | 27,602 | 32,642 | 32,801 | 35,480 | 39,321 | 42,408 | 42,203 |
| Pumping Energy (deduct) | 15,499– | 14,394– | 14,375– | 15,586– | 15,555– | 16,166– | 17,807– | 21,207– | 23,244– | 23,560– | 25,098– |
| Total Net Generation (Contiguous U.S.) | 2,247,626 | 2,299,452 | 2,392,591 | 2,483,631 | 2,573,836 | 2,658,084 | 2,763,610 | 2,879,598 | 2,988,579 | 3,100,143 | 3,191,795 |
| **PERCENTAGE BY SOURCE** | | | | | | | | | | | |
| Coal | 50.7% | 51.2% | 51.8% | 51.8% | 51.1% | 51.0% | 51.1% | 51.2% | 51.3% | 51.9% | 52.7% |
| Oil | 10.9 | 10.7 | 9.6 | 8.9 | 8.7 | 8.1 | 7.6 | 7.1 | 7.0 | 7.2 | 8.1 |
| Gas | 14.9 | 14.0 | 12.3 | 10.8 | 9.8 | 9.3 | 8.9 | 8.3 | 7.0 | 6.5 | 4.9 |
| Nuclear | 11.2 | 13.2 | 15.8 | 18.0 | 20.1 | 21.5 | 22.7 | 23.9 | 25.4 | 25.2 | 25.5 |
| Hydro, adverse conditions | 12.7 | 10.7 | 10.2 | 10.1 | 9.8 | 9.5 | 9.2 | 9.0 | 8.8 | 8.5 | 8.3 |
| Other | 0.3 | 0.8 | 0.6 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.3 | 1.4 | 1.3 |
| Pumping Energy (deduct) | 0.7– | 0.6– | 0.6– | 0.6– | 0.6– | 0.6– | 0.7– | 0.7– | 0.8– | 0.7– | 0.8– |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

# ADDITIONS TO ELECTRIC GENERATING CAPACITY

The number and aggregate capacity of new electric generating units placed in commercial operation during the first three months of 1981 are shown in the top portion of Table VIII. The distribution of these units among the nine reliability councils of the United States is indicated in the second portion of the table, while the third portion of the table presents the same data classified according to ownership.

Table IX presents the number and aggregate capacity of all new electric generating capacity on order, as of April 1, 1981, and scheduled for commercial operation during the last nine months of 1981 and later years. The second portion of the table presents this same information on the basis of the reliability councils in which the new capacity is to be installed, and the third portion of the table classifies the information according to ownership.

Tables VIII and IX include all steam turbine-generators, for both fossil and nuclear-fueled units, conventional hydraulic turbine-generators and those for pumped-storage plants, combustion turbine-generators, and diesel engine-generators, 4,000 kw and larger, of both domestic and foreign manufacture.

## Table VIII ADDITIONS TO ELECTRIC GENERATING CAPACITY DURING FIRST 3 MONTHS 1981 In Terms of Manufacturers Ratings of the Units

| | Thermal | | | | | | | | Hydraulic | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Steam Turbine-Generators | | | | Combustion Turbine-Generator | | Diesel Engine-Generators | | | | | | Total | |
| | Conventional | | Nuclear | | | | | | Conventional | | Pumped-Storage | | | |
| | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw |
| ADDITIONS FIRST 3 MONTHS 1981 | 2 | 743,290 | – | – | – | – | – | – | – | – | – | – | 2 | 743,290 |
| ADDITIONS BY REGION | | | | | | | | | | | | | | |
| NPCC | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| MAAC | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| ECAR | 1 | 508,290 | – | – | – | – | – | – | – | – | – | – | 1 | 508,290 |
| SERC | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| MAIN | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| SPP | 1 | 235,000 | – | – | – | – | – | – | – | – | – | – | 1 | 235,000 |
| ERCOT | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| MARCA | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| WSCC | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| ADDITIONS BY OWNERSHIP | | | | | | | | | | | | | | |
| Investor-Owned | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| Federal | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| Municipal | 1 | 235,000 | – | – | – | – | – | – | – | – | – | – | 1 | 235,000 |
| Cooperative | 1 | 508,290 | – | – | – | – | – | – | – | – | – | – | 1 | 508,290 |
| State and Local | – | – | – | – | – | – | – | – | – | – | – | – | – | – |

Another 50 units totaling 31 million kilowatts are also on order but have not been included in Table IX because the units are either awaiting their first assignment of a scheduled date of commercial operation by the utility systems, or were once scheduled and have since been removed from the expansion program. It is probable that the majority of the orders in the second category (being held open as options by the manufacturers) will not be reactivated.

The accompanying Table X shows the number and aggregate capacity of thermal generating units in the expansion program (Table IX) divided according to size range. It is significant to note from this tabulation that 126 units totaling 133.5 million kilowatts, or 69.0 percent of all the new thermal generating capacity on order and scheduled for service as of April 1, 1981, are in unit sizes of 700,000 kw and larger.

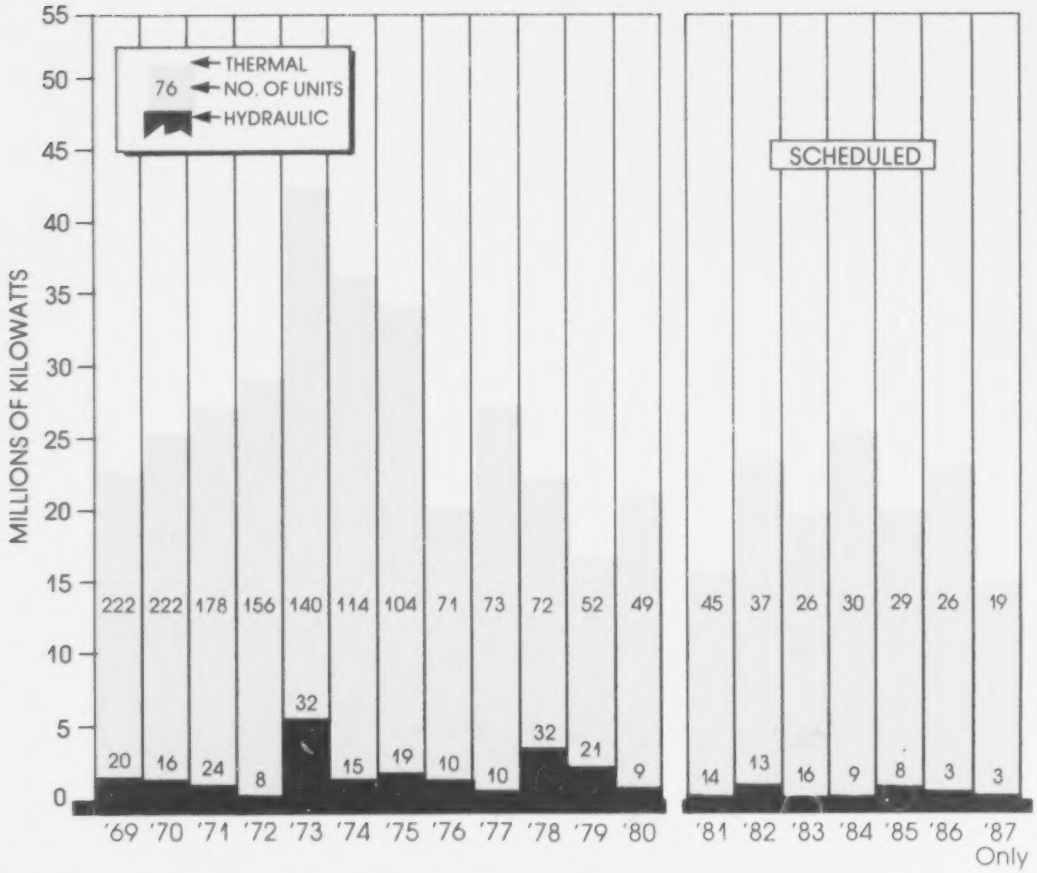
In sizes of 500,000 kw and larger, the aggregate capacity represents 90.2 percent of the total capacity shown.

Among the units under 100,000 kw, there are eight steam turbine-generators with an aggregate capacity of 338 mw, 11 combustion turbine-generators, aggregating 849 mw, and five diesel engine-generators, 4,000 kw and larger, totaling 29 mw.

The number and aggregate capacity of new thermal and hydraulic generating units 4,000 kw and larger, placed in commercial operation in the contiguous United States during the years 1970 through 1980, and those now scheduled for operation in 1981 and later years, including those placed in commercial operation during the first three months of 1981, are shown in Fig. 5.

## Table IX SCHEDULED ADDITIONS TO ELECTRIC GENERATING CAPACITY BASED ON SCHEDULED DATES OF COMMERCIAL OPERATION AS OF APRIL 1, 1981 In Terms of Manufacturers Ratings of the Units

| | Thermal | | | | | | | | Hydraulic | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Steam Turbine-Generators | | | | Combustion Turbine-Generator | | Diesel Engine-Generators | | | | | | Total | |
| | Conventional | | Nuclear | | | | | | Conventional | | Pumped-Storage | | | |
| | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw | Number of Units | Kw |
| TOTAL SCHEDULED | 165 | 88,471,308 | 89 | 102,677,150 | 16 | 2,213,970 | 5 | 28,707 | 47 | 2,471,552 | 23 | 5,317,402 | 345 | 201,180,089 |
| SCHEDULED ADDITIONS BY YEARS AS OF APRIL 1, 1981 | | | | | | | | | | | | | | |
| 1981 | 27 | 9,751,643 | 4 | 4,426,631 | 8 | 739,570 | 4 | 22,707 | 10 | 542,220 | 4 | 107,868 | 57 | 15,590,639 |
| 1982 | 22 | 10,138,599 | 11 | 11,979,688 | 3 | 231,060 | 1 | 6,000 | 10 | 467,800 | 3 | 1,050,000 | 50 | 23,873,147 |
| 1983 | 14 | 6,977,157 | 11 | 12,066,312 | 1 | 96,440 | – | – | 15 | 570,682 | 1 | 31,000 | 42 | 19,741,591 |
| 1984 | 16 | 9,067,504 | 14 | 16,029,786 | – | – | – | – | 9 | 749,970 | – | – | 39 | 25,847,260 |
| 1985 | 23 | 12,347,827 | 6 | 6,800,805 | – | – | – | – | 3 | 140,880 | 5 | 1,103,934 | 37 | 20,393,446 |
| 1986 | 13 | 8,036,175 | 12 | 14,506,697 | 1 | 72,900 | – | – | – | – | 3 | 1,050,000 | 29 | 23,665,772 |
| 1987 and later | 50 | 32,152,403 | 31 | 36,867,231 | 3 | 1,074,000 | – | – | – | – | 7 | 1,974,600 | 91 | 72,068,234 |
| SCHEDULED ADDITIONS BY REGIONS | | | | | | | | | | | | | | |
| NPCC | 4 | 2,420,565 | 6 | 6,831,111 | 3 | 242,860 | – | – | 6 | 53,650 | – | – | 19 | 9,548,186 |
| MAAC | 5 | 3,018,462 | 7 | 7,751,808 | – | – | – | – | – | – | – | – | 12 | 10,770,270 |
| ECAR | 29 | 16,171,127 | 10 | 9,727,517 | 1 | 72,900 | 2 | 11,757 | 2 | 50,000 | – | – | 44 | 26,033,301 |
| SERC | 29 | 17,130,693 | 29 | 33,452,499 | 1 | 23,500 | – | – | 12 | 654,012 | 13 | 4,074,600 | 84 | 55,335,304 |
| MAIN | 8 | 3,021,214 | 9 | 10,363,247 | – | – | – | – | – | – | – | – | 17 | 13,384,461 |
| SPP | 28 | 17,750,663 | 8 | 9,314,708 | 3 | 269,240 | 1 | 6,000 | 1 | 27,000 | 7 | 192,802 | 48 | 27,560,413 |
| ERCOT | 13 | 8,047,634 | 5 | 6,156,805 | – | – | – | – | – | – | – | – | 18 | 14,204,439 |
| MARCA | 16 | 7,131,086 | – | – | – | – | 2 | 10,950 | 1 | 49,970 | – | – | 19 | 7,192,006 |
| WSCC | 33 | 13,779,864 | 15 | 19,079,455 | 8 | 1,605,470 | – | – | 25 | 1,636,920 | 3 | 1,050,000 | 84 | 37,151,709 |
| SCHEDULED ADDITIONS BY OWNERSHIP | | | | | | | | | | | | | | |
| Investor-Owned | 116 | 68,995,680 | 70 | 78,621,733 | 11 | 1,889,110 | – | – | 14 | 513,162 | 16 | 5,124,600 | 227 | 155,144,285 |
| Federal | – | – | 14 | 17,528,802 | – | – | – | – | 28 | 1,769,220 | 7 | 192,802 | 49 | 19,490,824 |
| Municipal | 16 | 3,596,142 | – | – | 4 | 266,360 | 5 | 28,707 | 1 | 40,000 | – | – | 26 | 3,931,209 |
| Cooperative | 25 | 12,099,755 | – | – | – | – | – | – | – | – | – | – | 25 | 12,099,755 |
| State and Local | 8 | 3,779,731 | 5 | 6,526,615 | 1 | 58,500 | – | – | 4 | 149,170 | – | – | 18 | 10,514,016 |




## Table X NUMBER AND AGGREGATE CAPACITY OF THERMAL UNITS IN EXPANSION PROGRAM GROUPED ACCORDING TO SIZE RANGE AS OF APRIL 1, 1981 IN TERMS OF MANUFACTURERS RATINGS OF THE UNITS

| Size Range, Kw | No. of Units | Aggregate Capacity, Kw | % of Total |
|---|---|---|---|
| 1,300,000 Kw and Larger | 20 | 26,590,321 | 13.8 |
| 1,200,000 to 1,299,999 | 19 | 23,475,931 | 12.1 |
| 1,100,000 to 1,199,999 | 32 | 37,145,971 | 19.2 |
| 1,000,000 to 1,099,999 | 4 | 4,354,232 | 2.3 |
| 900,000 to 999,999 | 9 | 8,689,024 | 4.5 |
| 800,000 to 899,999 | 26 | 21,464,547 | 11.1 |
| 700,000 to 799,999 | 16 | 11,816,392 | 6.1 |
| 600,000 to 699,999 | 33 | 21,314,731 | 11.0 |
| 500,000 to 599,999 | 37 | 19,575,171 | 10.1 |
| 400,000 to 499,999 | 20 | 8,549,204 | 4.4 |
| 300,000 to 399,999 | 12 | 4,315,458 | 2.3 |
| 200,000 to 299,999 | 16 | 3,909,376 | 2.0 |
| 100,000 to 199,999 | 7 | 975,200 | .5 |
| Under 100,000 | 24 | 1,215,577 | .6 |
| TOTAL THERMAL UNITS | 275 | 193,391,135 | 100.0 |

# DELAYS AND REMOVALS FROM SCHEDULE

During 1980 the electric power systems removed from the expansion program nine nuclear units totaling 10,587 megawatts and five conventional steam turbine-generators aggregating 3,349 megawatts. During the same twelve-month period the electric power systems also deferred by a year or more 78 steam turbine-generators, 300 megawatts or larger, totaling 77,004 megawatts, of which 50 units, totaling 58,987 megawatts, were nuclear.

During the first three months of 1981, five nuclear units rated at 6,705 megawatts, were removed from the expansion program, but no conventional units were removed from schedule. Deferred by a year or more, during the first quarter, were 14 steam turbine-generators, 300 megawatts or larger, totaling 11,705 megawatts, of which 6 units, totaling 6,965 megawatts, were nuclear.

# NUCLEAR ELECTRIC POWER

During the first three months of 1981, no nuclear power generating units were ordered.

As of April 1, 1981, nuclear capacity accounts for 51 percent of the aggregate of the industry's scheduled expansion program.

As of the date of this survey, there were 71 nuclear units in commercial operation. These 71 units, which have a winter rating of 51.4 kilowatts, are listed in the accompanying tabulation. There were no additions to nuclear generating capacity during the first three months of 1981.

During the last nine months of 1981, four nuclear power units are scheduled for commercial operation. These four units have an aggregate capacity of 4.4 million kilowatts.

As of April 1981, there are 85 additional nuclear units on order and scheduled for commercial operation after 1981 in the contiguous United States, having an aggregate capacity of 98.3 million kilowatts. These units are included in the regional list given in Appendix I.

Investor-owned electric power systems are presently associated with 70 of the units listed in Appendix I as scheduled for future operation. Non-Federal government-owned systems are participating in five of the units, and the Federal government systems are constructing 14 nuclear units.

## Table XI NUCLEAR POWER UNITS IN THE CONTIGUOUS U.S. AS OF APRIL 1, 1981

| Name of System or Sponsor | Name or Location | Capability-MW | | Type of Reactor | Placed in Commercial Operation |
|---|---|---|---|---|---|
| | | Summer | Winter | | |
| Duquesne Light Company | Shippingport No. 1 | 60 | 60 | LWBR | 1957 |
| Commonwealth Edison Company | Dresden No. 1 | 197 | 207 | BWR | 1960 |
| Yankee Atomic Electric Company | Yankee No. 1 | 175 | 176 | PWR | 1961 |
| Consumers Power Company | Big Rock Point | 63 | 63 | BWR | 1962 |
| Pacific Gas & Electric Company | Humboldt Bay | 63 | 63 | BWR | 1963 |
| Washington Public Power Supply System | Hanford | 840 | 840 | GMWC | 1966 |
| Connecticut Yankee Atomic Power Company | Haddam No. 1 | 555 | 580 | PWR | 1968 |
| Southern California Edison Company and San Diego Gas & Electric Company | San Onofre No. 1 | 436 | 436 | PWR | 1968 |
| Jersey Central Power & Light Company | Oyster Creek No. 1 | 620 | 650 | BWR | 1969 |
| Niagara Mohawk Power Corporation | Nine Mile Point No. 1 | 610 | 610 | BWR | 1969 |
| Rochester Gas and Electric Corporation | Ginna No. 1 | 470 | 470 | PWR | 1969 |
| Northeast Utilities | Millstone Point No. 1 | 654 | 660 | BWR | 1970 |
| Wisconsin Electric Power Company | Point Beach No. 1 | 495 | 495 | PWR | 1970 |
| Carolina Power & Light Company | Robinson No. 2 | 665 | 700 | PWR | 1971 |
| Dairyland Power Cooperative | La Crosse | 46 | 46 | BWR | 1971 |
| Northern States Power Company | Monticello No. 1 | 536 | 557 | BWR | 1971 |
| Commonwealth Edison Company | Dresden No. 2 | 772 | 794 | BWR | 1971 |
| Boston Edison Company | Pilgrim No. 1 | 670 | 670 | BWR | 1972 |
| Commonwealth Edison Company | Quad Cities No. 1 | 768 | 789 | BWR | 1972 |
| Commonwealth Edison Company | Quad Cities No. 2 | 769 | 789 | BWR | 1972 |
| Florida Power & Light Company | Turkey Point No. 3 | 666 | 696 | PWR | 1972 |
| Maine Yankee Atomic Power Company | Wiscasset | 814 | 830 | PWR | 1972 |
| Vermont Yankee Nuclear Power Corporation | Vernon | 496 | 528 | BWR | 1972 |
| Virginia Electric & Power Company | Surry No. 1 | 775 | 775 | PWR | 1972 |
| Commonwealth Edison Company | Dresden No. 3 | 773 | 794 | BWR | 1973 |
| Consumers Power Company | Palisades No. 1 | 635 | 740 | PWR | 1973 |
| Duke Power Company | Oconee No. 1 | 860 | 860 | PWR | 1973 |
| Duke Power Company | Oconee No. 2 | 860 | 860 | PWR | 1973 |
| Florida Power and Light Company | Turkey Point No. 4 | 666 | 696 | PWR | 1973 |
| Northern States Power Company | Prairie Island No. 1 | 503 | 523 | PWR | 1973 |
| Omaha Public Power District | Fort Calhoun No. 1 | 439 | 457 | PWR | 1973 |
| Tennessee Valley Authority | Browns Ferry No. 1 | 1,067 | 1,067 | BWR | 1973 |
| Virginia Electric and Power Company | Surry No. 2 | 775 | 775 | PWR | 1973 |
| Wisconsin Electric Power Company | Point Beach No. 2 | 495 | 495 | PWR | 1973 |
| Arkansas Power and Light Company | Arkansas Nuclear No. 1 | 836 | 836 | PWR | 1974 |
| Commonwealth Edison Company | Zion No. 1 | 1,040 | 1,040 | PWR | 1974 |
| Commonwealth Edison Company | Zion No. 2 | 1,040 | 1,040 | PWR | 1974 |
| Consolidated Edison Company of N.Y., Inc. | Indian Point No. 2 | 849 | 864 | PWR | 1974 |
| Duke Power Company | Oconee No. 3 | 860 | 860 | PWR | 1974 |
| Iowa Electric Light and Power Company | Arnold No. 1 | 480 | 510 | BWR | 1974 |
| Metropolitan Edison Company | Three Mile Island No. 1 | 776 | 800 | PWR | 1974 |
| Nebraska Public Power District | Cooper Nuclear No. 1 | 778 | 778 | BWR | 1974 |
| Northern States Power Company | Prairie Island No. 2 | 500 | 520 | PWR | 1974 |
| Philadelphia Electric Company | Peach Bottom No. 2 | 1,051 | 1,055 | BWR | 1974 |
| Philadelphia Electric Company | Peach Bottom No. 3 | 1,035 | 1,035 | BWR | 1974 |
| Wisconsin Public Service Corporation | Kewaunee No. 1 | 525 | 517 | PWR | 1974 |
| Baltimore Gas & Electric Company | Calvert Cliffs No. 1 | 810 | 820 | PWR | 1975 |
| Carolina Power & Light Company | Brunswick No. 2 | 790 | 790 | BWR | 1975 |
| Georgia Power Company | Hatch No. 1 | 771 | 771 | BWR | 1975 |
| Indiana & Michigan Electric Company | Cook No. 1 | 1,050 | 1,050 | PWR | 1975 |
| Power Authority of the State of New York | Fitzpatrick No. 1 | 821 | 821 | BWR | 1975 |
| Sacramento Utility District | Rancho Seco No. 1 | 875 | 903 | PWR | 1975 |
| Tennessee Valley Authority | Browns Ferry No. 2 | 1,067 | 1,067 | BWR | 1975 |
| Duquesne Light Company | Beaver Valley No. 1 | 800 | 800 | PWR | 1976 |
| Florida Power and Light Company | St. Lucie No. 1 | 777 | 795 | PWR | 1976 |
| Northeast Utilities | Millstone Point No. 2 | 864 | 864 | PWR | 1976 |
| Portland General Electric Company | Trojan | 1,080 | 1,080 | PWR | 1976 |
| Power Authority of the State of New York | Indian Point No. 3 | 965 | 965 | PWR | 1976 |
| Alabama Power Company | Farley No. 1 | 807 | 807 | PWR | 1977 |
| Baltimore Gas and Electric Company | Calvert Cliffs No. 2 | 825 | 860 | PWR | 1977 |
| Carolina Power and Light Company | Brunswick No. 1 | 790 | 790 | BWR | 1977 |
| Florida Power Corporation | Crystal River No. 3 | 782 | 807 | PWR | 1977 |
| Public Service Electric and Gas Company | Salem Nuclear No. 1 | 1,079 | 1,100 | PWR | 1977 |
| Tennessee Valley Authority | Browns Ferry No. 3 | 1,067 | 1,067 | BWR | 1977 |
| Toledo Edison Company | Davis-Besse No. 1 | 906 | 906 | PWR | 1977 |
| Indiana & Michigan Electric Company | Cook No. 2 | 1,100 | 1,100 | PWR | 1978 |
| Virginia Electric & Power Company | North Anna No. 1 | 898 | 907 | PWR | 1978 |
| Georgia Power Company | Hatch No. 2 | 771 | 771 | BWR | 1979 |
| Public Service Company of Colorado | Fort St. Vrain No. 1 | 200 | 200 | HTGR | 1979 |
| Arkansas Power & Light Company | Arkansas Nuclear No. 2 | 858 | 858 | PWR | 1980 |
| Virginia Electric & Power Company | North Anna No. 2 | 870 | 870 | PWR | 1980 |
| TOTAL | 71 Units | 50,681 | 51,371 | | |

BWR = Boiling Water Reactor
GMWC = Graphite Moderated, Water Cooled Reactor
HTGR = High Temperature, Gas-Cooled Reactor
LWBR = Light Water Breeder Reactor
PWR = Pressurized Water Reactor

# PART II/MANUFACTURE OF HEAVY ELECTRIC POWER EQUIPMENT IN THE U.S.A.

This section of the report presents a summary, as of April 1, 1981, of information relative to shipments, new orders, and scheduled production of heavy electric power equipment by the leading manufacturers in the United States.

Orders placed by U.S. electric power systems with foreign manufacturers for conventional and nuclear steam turbine-generators, generators for hydraulic turbines, hydraulic turbines, and combustion turbine-generators are shown as an additional line below the domestic manufacturers' total on the respective equipment tables.

The accompanying order and backlog synopsis table (Table XII) also incorporates orders to foreign manufacturers for certain types of equipment.

This is the fourth year that Table XIX, on the manufacture of power transformers, shows data for four size classifications above 501 Kva rather than the two size classifications previously used.

Information relative to estimated open manufacturing capacity, where given, is based on current estimates by the individual manufacturers of the aggregate capacity of new equipment, over and above that on order and scheduled for delivery as of April 1, 1981, that could be produced and shipped during the years indicated – provided orders were placed in the very near future.

## Table XII CAPACITY OF NEW HEAVY POWER EQUIPMENT PLACED ON ORDER WITH MANUFACTURERS DURING 1980 AND DURING FIRST THREE MONTHS OF 1981 AND TOTAL CAPACITY ON ORDER AND SCHEDULED FOR SHIPMENT AS OF APRIL 1, 1981 BY U.S. ELECTRIC POWER SYSTEMS

| | Ordered | | Total on Order and Scheduled for Shipment as of 4-1-81 |
|---|---|---|---|
| | 1980 | First 3 Months 1981 | |
| Electric Generating Units (4,000 Kw and Larger) | | | |
| Steam Turbine-Generators, Kw | | | |
| Conventional | 2,846,000(a) | 5,481,284(a) | 66,960,039(a) |
| Nuclear | – | – | 29,364,582(a) |
| Combustion Turbine-Generators, Kw | 551,190 | 26,050 | 2,422,940 |
| Generators for Hydraulic Turbines, Kw | 15,010 | 110,240 | 4,895,670(a) |
| TOTAL | 3,412,200(a) | 5,617,574(a) | 103,643,231(a) |
| Steam Generators, 1,000 Lbs Steam Per Hour | 34,363 | 3,800 | 258,675 |
| Nuclear Power Reactors (50,000 Kwe and Larger) | – | – | 111,425,000 |
| Hydraulic Turbines, Hp | 17,600(a) | – | 5,560,080(a) |
| Power Transformers, Mva(b) | 123,037 | 28,943 | 233,959 |

(a) Includes equipment on order with foreign manufacturers.
(b) Includes U.S. Industrials.

## Table XIII MANUFACTURE OF ELECTRIC GENERATING EQUIPMENT – STEAM AND HYDRAULIC UNITS* – 4,000 KW AND LARGER**

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 34 | 6 | 32 | 38 | 33 | 25 | 17 | 7 | 66 | 180 | 11 |
| Kw | 15,952,642 | 2,947,725 | 10,793,963 | 13,741,688 | 12,054,556 | 11,548,602 | 8,654,234 | 4,598,700 | 50,623,536 | 98,273,591 | 5,280,024 |
| U.S. Industrials | | | | | | | | | | | |
| Units | 10 | 1 | 14 | 15 | 4 | 1 | 2 | – | – | 21 | – |
| Kw | 194,900 | 10,000 | 366,795 | 376,795 | 113,872 | 54,000 | 50,000 | – | – | 584,667 | – |
| Outside U.S. | | | | | | | | | | | |
| Units | 23 | 3 | 9 | 12 | 6 | 10 | 3 | 1 | 2 | 31 | 2 |
| Kw | 6,125,929 | 219,000 | 2,527,175 | 2,746,175 | 2,271,675 | 6,026,745 | 1,925,070 | 647,000 | 1,627,000 | 15,024,665 | 1,412,992 |
| TOTAL | | | | | | | | | | | |
| Units | 67 | 10 | 55 | 65 | 43 | 36 | 22 | 8 | 68 | 232 | 13 |
| Kw | 22,273,471 | 3,176,725 | 13,687,933 | 16,864,658 | 14,440,103 | 17,629,347 | 10,629,304 | 5,245,700 | 52,250,536 | 113,882,923 | 6,693,016 |

*Does not include combustion turbine-generators, but does include steam turbine-generators for nuclear power plants.
**Manufacturers ratings.

## Table XIV MANUFACTURE OF STEAM TURBINE-GENERATORS – 4,000 KW AND LARGER*

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 25 | 5 | 18 | 23 | 20 | 20 | 12 | 6 | 63 | 139 | 7 |
| Kw | 14,610,422 | 2,597,725 | 8,964,263 | 11,561,988 | 11,453,206 | 11,016,062 | 7,948,154 | 4,317,000 | 49,778,436 | 93,477,121 | 5,169,784 |
| U.S. Industrials | | | | | | | | | | | |
| Units | 10 | 1 | 14 | 15 | 4 | 1 | 2 | – | – | 21 | – |
| Kw | 194,900 | 10,000 | 366,795 | 376,795 | 113,872 | 54,000 | 50,000 | – | – | 584,667 | – |
| Outside U.S. | | | | | | | | | | | |
| Units | 20 | 2 | 9 | 11 | 6 | 10 | 3 | 1 | 2 | 31 | 2 |
| Kw | 5,558,929 | 30,000 | 2,527,175 | 2,557,175 | 2,271,675 | 6,026,745 | 1,925,070 | 647,000 | 1,627,000 | 15,024,665 | 1,412,992 |
| Total | | | | | | | | | | | |
| Units | 55 | 8 | 41 | 49 | 30 | 31 | 17 | 7 | 65 | 191 | 9 |
| Kw | 20,364,251 | 2,637,725 | 11,858,233 | 14,495,958 | 13,838,753 | 17,096,807 | 9,923,224 | 4,964,000 | 51,405,436 | 109,086,453 | 6,582,776 |

*Manufacturers ratings.

## Table XIV-A MANUFACTURE OF CONVENTIONAL STEAM TURBINE-GENERATORS – 4,000 KW AND LARGER* (INCLUDED IN TABLE XIV)

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 21 | 5 | 16 | 21 | 18 | 19 | 12 | 6 | 43 | 114 | 7 |
| Kw | 9,561,963 | 2,597,725 | 6,629,263 | 9,226,988 | 8,754,747 | 9,856,062 | 7,948,154 | 4,317,000 | 26,607,313 | 64,112,539 | 5,169,784 |
| U.S. Industrials | | | | | | | | | | | |
| Units | 10 | 1 | 14 | 15 | 4 | 1 | 2 | – | – | 21 | – |
| Kw | 194,900 | 10,000 | 366,795 | 376,795 | 113,872 | 54,000 | 50,000 | – | – | 584,667 | – |
| Outside U.S. | | | | | | | | | | | |
| Units | 17 | 2 | 8 | 10 | 5 | 6 | 2 | 1 | 1 | 23 | – |
| Kw | 2,680,809 | 30,000 | 1,719,500 | 1,749,500 | 1,464,000 | 2,518,574 | 1,218,574 | 647,000 | 647,000 | 8,214,648 | – |
| Total | | | | | | | | | | | |
| Units | 48 | 8 | 38 | 46 | 27 | 26 | 16 | 7 | 44 | 158 | 7 |
| Kw | 12,437,672 | 2,637,725 | 8,715,558 | 11,353,283 | 10,332,619 | 12,428,636 | 9,216,728 | 4,964,000 | 27,254,313 | 72,911,854 | 5,169,784 |
| Orders to Foreign Manufacturers | | | | | | | | | | | |
| Units | 2 | – | 4 | 4 | 3 | 2 | – | 3 | – | 12 | 4 |
| Kw | 1,432,000 | – | 716,000 | 716,000 | 151,500 | 970,000 | – | 1,010,000 | – | 2,847,500 | 311,500 |

*Manufacturers ratings

## Table XIV-B MANUFACTURE OF NUCLEAR STEAM TURBINE-GENERATORS – 50,000 KW AND LARGER* (INCLUDED IN TABLE XIV)

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 4 | – | 2 | 2 | 2 | 1 | – | – | 20 | 25 | – |
| Kw | 5,048,459 | – | 2,335,000 | 2,335,000 | 2,698,459 | 1,160,000 | – | – | 23,171,123 | 29,364,582 | – |
| U.S. Industrials | | | | | | | | | | | |
| Units | – | – | – | – | – | – | – | – | – | – | – |
| Kw | – | – | – | – | – | – | – | – | – | – | – |
| Outside U.S. | | | | | | | | | | | |
| Units | 3 | – | 1 | 1 | 1 | 4 | 1 | – | 1 | 8 | 2 |
| Kw | 2,878,120 | – | 807,675 | 807,675 | 807,675 | 3,508,171 | 706,496 | – | 980,000 | 6,810,017 | 1,412,992 |
| Total | | | | | | | | | | | |
| Units | 7 | – | 3 | 3 | 3 | 5 | 1 | – | 21 | 33 | 2 |
| Kw | 7,926,579 | – | 3,142,675 | 3,142,675 | 3,506,134 | 4,668,171 | 706,496 | – | 24,151,123 | 36,174,599 | 1,412,992 |
| Orders to Foreign Manufacturers | | | | | | | | | | | |
| Units | 2 | 1 | – | 1 | – | – | – | – | – | – | – |
| Kw | 2,537,032 | 1,268,516 | – | 1,268,516 | – | – | – | – | – | – | – |

*Manufacturers ratings.

## Table XV MANUFACTURE OF GENERATORS FOR HYDRAULIC TURBINES* – 4,000 KW AND LARGER**

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 9 | 1 | 14 | 15 | 13 | 5 | 5 | 1 | 3 | 41 | 4 |
| Kw | 1,342,220 | 350,000 | 1,829,700 | 2,179,700 | 601,350 | 532,540 | 706,080 | 281,700 | 845,100 | 4,796,470 | 110,240 |
| U.S. INDUSTRIALS | | | | | | | | | | | |
| Units | – | – | – | – | – | – | – | – | – | – | – |
| Kw | – | – | – | – | – | – | – | – | – | – | – |
| Outside U.S. | | | | | | | | | | | |
| Units | 3 | 1 | – | 1 | – | – | – | – | – | – | – |
| Kw | 567,000 | 189,000 | – | 189,000 | – | – | – | – | – | – | – |
| Total | | | | | | | | | | | |
| Units | 12 | 2 | 14 | 16 | 13 | 5 | 5 | 1 | 3 | 41 | 4 |
| Kw | 1,909,220 | 539,000 | 1,829,700 | 2,368,700 | 601,350 | 532,540 | 706,080 | 281,700 | 845,100 | 4,796,470 | 110,240 |
| Orders to Foreign Manufacturers | | | | | | | | | | | |
| Units | – | – | 3 | 3 | – | – | – | – | – | 3 | – |
| Kw | – | – | 99,200 | 99,200 | – | – | – | – | – | 99,200 | – |

*Includes generators for pumped-storage plants.
**Manufacturers Ratings.

## Table XVI MANUFACTURE OF CONVENTIONAL STEAM GENERATORS – 450 PSI PRESSURE AND HIGHER

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 19 | 4 | 10 | 14 | 19 | 10 | 6 | 7 | 8 | 60 | 1 |
| M lb/hr | 85,478 | 10,753 | 33,783 | 44,536 | 81,522 | 42,018 | 25,418 | 30,849 | 45,085 | 258,675 | 3,800 |
| U.S. Industrials | | | | | | | | | | | |
| Units | 9 | 4 | 9 | 13 | 2 | 1 | – | – | – | 12 | 3 |
| M lb/hr | 3,400 | 1,955 | 3,569 | 5,524 | 300 | 650 | – | – | – | 4,519 | 950 |
| Outside U.S. | | | | | | | | | | | |
| Units | 10 | – | 7 | 7 | 4 | 1 | – | 2 | 1 | 15 | – |
| M lb/hr | 13,396 | – | 22,764 | 22,764 | 9,060 | 3,748 | – | 6,152 | 3,748 | 45,472 | – |
| Total | | | | | | | | | | | |
| Units | 38 | 8 | 26 | 34 | 25 | 12 | 6 | 9 | 9 | 87 | 4 |
| M lb/hr | 102,274 | 12,708 | 60,116 | 72,824 | 90,882 | 46,416 | 25,418 | 37,001 | 48,833 | 308,666 | 4,750 |

## Table XVII MANUFACTURE OF HYDRAULIC TURBINES* – 5,000 HORSEPOWER AND LARGER

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 6 | 2 | 11 | 13 | 3 | – | 4 | 3 | 3 | 24 | – |
| Hp | 750,000 | 210,000 | 2,203,000 | 2,413,000 | 32,300 | – | 717,180 | 1,365,000 | 1,035,000 | 5,352,480 | – |
| U.S. Industrials | | | | | | | | | | | |
| Units | – | 2 | – | 2 | – | – | – | – | – | – | – |
| Hp | – | 22,530 | – | 22,530 | – | – | – | – | – | – | – |
| Outside U.S. | | | | | | | | | | | |
| Units | 1 | – | – | – | 4 | 3 | – | – | – | 7 | – |
| Hp | 250,000 | – | – | – | 392,420 | 960,000 | – | – | – | 1,352,420 | – |
| Total | | | | | | | | | | | |
| Units | 7 | 4 | 11 | 15 | 7 | 3 | 4 | 3 | 3 | 31 | – |
| Hp | 1,000,000 | 232,530 | 2,203,000 | 2,435,530 | 424,720 | 960,000 | 717,180 | 1,365,000 | 1,035,000 | 6,704,900 | – |
| Orders to Foreign Manufacturers | | | | | | | | | | | |
| Units | – | – | 1 | 1 | – | 1 | – | – | – | 2 | – |
| Hp | – | – | 190,000 | 190,000 | – | 17,600 | – | – | – | 207,600 | – |

*Includes hydraulic turbines for pumped-storage plants.

## Table XVIII MANUFACTURE OF COMBUSTION TURBINE-GENERATORS – 4,000 KW AND LARGER*

| | Shipped | | Scheduled as of April 1, 1981 | | | | | | | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | | |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 9 | 3 | 4 | 7 | 1 | 1 | 2 | 5 | – | 13 | 1 |
| Kw | 641,780 | 183,180 | 428,040 | 611,220 | 72,900 | 308,000 | 859,200 | 754,800 | – | 2,422,940 | 25,050 |
| U.S. Industrials | | | | | | | | | | | |
| Units | – | – | – | – | 3 | – | – | – | – | 3 | 3 |
| Kw | – | – | – | – | 289,320 | – | – | – | – | 289,320 | 289,320 |
| Outside U.S. | | | | | | | | | | | |
| Units | 20 | 3 | 3 | 6 | 3 | – | – | – | – | 6 | – |
| Kw | 1,426,250 | 228,670 | 236,980 | 465,650 | 276,720 | – | – | – | – | 513,700 | – |
| TOTAL | | | | | | | | | | | |
| Units | 29 | 6 | 7 | 13 | 7 | 1 | 2 | 5 | – | 22 | 4 |
| Kw | 2,068,030 | 411,850 | 665,020 | 1,076,870 | 638,940 | 308,000 | 859,200 | 754,800 | – | 3,225,960 | 315,370 |
| Orders to Foreign Manufacturers | | | | | | | | | | | |
| Units | – | – | – | – | – | – | – | – | – | – | – |
| Kw | – | – | – | – | – | – | – | – | – | – | – |

*Manufacturers ratings.

# Table XIX MANUFACTURE OF POWER TRANSFORMERS – 501 KVA AND LARGER

| | | | Shipped | | Scheduled as of April 1, 1981 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | Total Scheduled for Shipment as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
| **501 to 10,000 Kva** | | | | | | | | | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | | Units | 5,570 | 1,432 | 2,528 | 3,960 | 95 | 186 | 19 | 18 | 68 | 2,914 | 1,358 |
| | | Mva | 14,728 | 3,476 | 7,354 | 10,830 | 280 | 340 | 132 | 82 | 476 | 8,664 | 4,009 |
| Outside U.S. | | Units | 347 | 81 | 187 | 268 | – | 3 | – | – | – | 190 | 77 |
| | | Mva | 1,048 | 249 | 537 | 786 | – | 3 | – | – | – | 540 | 236 |
| | TOTAL | Units | 5,917 | 1,513 | 2,715 | 4,228 | 95 | 189 | 19 | 18 | 68 | 3,104 | 1,435 |
| | | Mva | 15,776 | 3,725 | 7,891 | 11,616 | 280 | 343 | 132 | 82 | 476 | 9,204 | 4,245 |
| **10,001 to 30,000 Kva** | | | | | | | | | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | | Units | 834 | 210 | 569 | 779 | 86 | 48 | 10 | 9 | 37 | 759 | 225 |
| | | Mva | 22,758 | 5,671 | 15,920 | 21,591 | 2,538 | 1,667 | 361 | 212 | 963 | 21,651 | 6,121 |
| Outside U.S. | | Units | 36 | 11 | 17 | 28 | – | – | – | – | 17 | 34 | 6 |
| | | Mva | 962 | 260 | 549 | 809 | – | – | – | – | 433 | 982 | 167 |
| | TOTAL | Units | 870 | 221 | 586 | 807 | 86 | 48 | 10 | 9 | 54 | 793 | 231 |
| | | Mva | 23,720 | 5,931 | 16,469 | 22,400 | 2,538 | 1,667 | 361 | 212 | 1,396 | 22,633 | 6,288 |
| **30,001 to 100,000 Kva** | | | | | | | | | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | | Units | 319 | 76 | 220 | 296 | 42 | 43 | 2 | 5 | 107 | 419 | 78 |
| | | Mva | 21,034 | 5,235 | 14,425 | 19,660 | 2,726 | 3,129 | 81 | 385 | 7,215 | 27,961 | 4,793 |
| Outside U.S. | | Units | 27 | 1 | 16 | 17 | – | 2 | – | – | – | 18 | 3 |
| | | Mva | 2,732 | 125 | 1,348 | 1,473 | – | 160 | – | – | – | 1,508 | 240 |
| | TOTAL | Units | 346 | 77 | 236 | 313 | 42 | 45 | 2 | 5 | 107 | 437 | 81 |
| | | Mva | 23,766 | 5,360 | 15,773 | 21,133 | 2,726 | 3,289 | 81 | 385 | 7,215 | 29,469 | 5,033 |
| **100,001 Kva and Larger** | | | | | | | | | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | | Units | 236 | 46 | 137 | 183 | 115 | 51 | 33 | 27 | 109 | 472 | 46 |
| | | Mva | 87,918 | 16,383 | 48,535 | 64,918 | 40,768 | 19,399 | 13,299 | 10,448 | 43,234 | 175,683 | 14,020 |
| Outside U.S. | | Units | 9 | 1 | 21 | 22 | – | – | – | – | – | 21 | 1 |
| | | Mva | 4,174 | 211 | 9,061 | 9,272 | – | – | – | – | – | 9,061 | 140 |
| | TOTAL | Units | 245 | 47 | 158 | 205 | 115 | 51 | 33 | 27 | 109 | 493 | 46 |
| | | Mva | 92,092 | 16,594 | 57,596 | 74,190 | 40,768 | 19,399 | 13,299 | 10,448 | 43,234 | 184,744 | 14,160 |
| **TOTAL (501 Kva and Larger)** | | | | | | | | | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | | Units | 6,959 | 1,764 | 3,454 | 5,218 | 338 | 328 | 64 | 59 | 321 | 4,564 | 1,706 |
| | | Mva | 146,438 | 30,765 | 86,234 | 116,999 | 46,312 | 24,525 | 13,873 | 11,127 | 51,888 | 233,959 | 28,943 |
| Outside U.S. | | Units | 419 | 94 | 241 | 335 | – | 5 | – | – | 17 | 263 | 87 |
| | | Mva | 8,916 | 845 | 11,495 | 12,340 | – | 163 | – | – | 433 | 12,091 | 783 |
| | TOTAL | Units | 7,378 | 1,858 | 3,695 | 5,553 | 338 | 333 | 64 | 59 | 338 | 4,827 | 1,793 |
| | | Mva | 155,354 | 31,610 | 97,729 | 129,339 | 46,312 | 24,688 | 13,873 | 11,127 | 52,321 | 246,050 | 29,716 |
| Estimated Open Manufacturing Capacity for Production of Additional Power Transformers, 501 Kva and Larger, Mva | | | | | | 44,000 | 115,000 | 131,000 | 152,000 | 15[illegible],000 | 160,000 (1986 only) | | |

## Table XX MANUFACTURE OF NUCLEAR REACTORS – 50,000 KWE AND LARGER*

| | Completed | | Scheduled as of April 1, 1981 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | First 3 Months 1981 | Last 9 Months 1981 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 and Later | Total Scheduled as of 4-1-81 | New Orders Placed 1-1-81 to 4-1-81 |
| U.S. Electric Power Systems | | | | | | | | | | | |
| Units | 3 | – | 7 | 7 | 10 | 14 | 10 | 6 | 52 | 100 | – |
| Kwe | 3,005,000 | – | 7,292,000 | 7,292,000 | 11,083,000 | 14,950,000 | 10,894,000 | 6,700,000 | 59,206,000 | 111,425,000 | – |
| Outside U.S. | | | | | | | | | | | |
| Units | 2 | – | 3 | 3 | 4 | 8 | 6 | 2 | 12 | 35 | – |
| Kwe | 1,752,000 | – | 2,479,000 | 2,479,000 | 3,657,000 | 6,705,000 | 4,903,000 | 1,807,000 | 11,595,000 | 31,146,000 | – |
| Total | | | | | | | | | | | |
| Units | 5 | – | 10 | 10 | 14 | 22 | 16 | 8 | 64 | 135 | – |
| Kwe | 4,757,000 | – | 9,771,000 | 9,771,000 | 14,740,000 | 21,655,000 | 15,797,000 | 8,507,000 | 70,801,000 | 142,571,000 | – |

*Manufacturers Ratings.

# APPENDIX I

## Scheduled Additions to Electric Generating Capacity Based on Scheduled Dates of Commercial Operations as of April 1, 1981, and Capacity Placed in Service During the First Three Months of 1981.

Includes all electric generating units 4,000 kw and larger on order and scheduled for service by the U.S. Electric Power Systems.

**SYMBOLS:**

| | |
|---|---|
| Investor-Owned | I |
| Federal | F |
| Municipal | M |
| Cooperative | C |
| State & Local | SL |
| Thermal | |
| Conventional steam turbine-generator | T |
| Nuclear steam turbine-generator | N |
| Combustion turbine-generator | G |
| Diesel engine-generator | D |
| Hydraulic | |
| Hydraulic turbine-generator | H |
| Pumped-Storage | |
| Pumped-storage turbine-generator | S |
| Reversible pumped-storage turbine-generator | R |
| Combined-Cycle | |
| Combustion turbine-generator for combined-cycle operation | GC |
| Conventional steam turbine-generator for combined-cycle operation | TC |

* Denotes units placed in commercial operation during the first three months of 1981.

° Denotes units added to the expansion program since April 1, 1980.

+ Denotes multiple ownership of the unit. In such cases, the name of the participating power system in whose service area the installation will be located is shown. In case the location does not fall within the service area of any of the participants, the name of the power system shown is the first in alphabetical order among the major participants.

NOTES: Kilowatts shown for individual generating units represent, in most cases, the net operating capability expected by the power systems; in other cases they represent the manufacturer's nameplate rating of the unit.

It is the convention in listing combined-cycle projects that the first line item is the combustion turbine-generator and the second line item is the steam turbine-generator. Combined-cycle operation is indicated by the symbols GC and TC in a brace:

GC }
TC }

## NPCC

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| BOSTON EDISON CO | PILGRIM NO 2 | I | N | 1,150,000 | 1987 |
| CENTRAL MAINE POWER CO | BRUNSWICK TOPSHAM | I | H | 12,000 | 1982 |
| LONG ISLAND LIGHTING CO | SHOREHAM NO 1 | I | N | 813,000 | 1982 |
| MASSACHUSETTS MUNICIPAL WHOLESALE ELEC C | STONY BROOK ENERGY CENT | M | GC | 100,000 | 1981 |
| MASSACHUSETTS MUNICIPAL WHOLESALE ELEC C | STONY BROOK ENERGY CENT | M | TC | 241,000 | 1981 |
| MASSACHUSETTS MUNICIPAL WHOLESALE ELEC C | STONY BROOK ENERGY CENT | M | G | 85,000 | 1982 |
| MASSACHUSETTS MUNICIPAL WHOLESALE ELEC C | STONY BROOK GTB | M | G | 85,000 | 1982 |
| NEW STATE ELECTRIC & GAS CORP | SOMERSET NO 1 | I | T | 625,000 | 1984 |
| ○NEW YORK STATE ELECTRIC & GAS CO | UPPER MECHSVILLE NO1 | I | H | 8,400 | 1983 |
| ○NEW YORK STATE ELECTRIC & GAS CO | UPPER MECHSVILLE NO2 | I | H | 8,400 | 1983 |
| NIAGARA MOHAWK POWER CORP | GRANBY NO 1 | I | H | 5,000 | 1983 |
| NIAGARA MOHAWK POWER CORP | GRANBY NO 2 | I | H | 5,000 | 1983 |
| NIAGARA MOHAWK POWER CORP | LAKE ERIE NO 1 | I | T | 860,000 | 1991 |
| NIAGARA MOHAWK POWER CORP | NINE MILE POINT NO 2 | I | N | 1,080,000 | 1986 |
| NORTHEAST UTILITIES | HADLEY FALLS NO 2 | I | H | 15,000 | 1983 |
| NORTHEAST UTILITIES | MILLSTONE POINT NO 3 | I | N | 1,150,000 | 1986 |
| POWER AUTHORITY OF THE STATE OF NEW YORK | 700 MW FOSSIL | SL | T | 700,000 | 1987 |
| PUBLIC SERVICE CO OF NEW HAMPSHIRE | SEABROOK NO 1 | I | N | 1,150,000 | 1984 |
| PUBLIC SERVICE CO OF NEW HAMPSHIRE | SEABROOK NO 2 | I | N | 1,150,000 | 1986 |

## MAAC

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| BALTIMORE GAS & ELECTRIC CO | BRANDON SHORES NO 1 | I | T | 610,000 | 1984 |
| BALTIMORE GAS & ELECTRIC CO | BRANDON SHORES NO 2 | I | T | 610,000 | 1988 |
| ○DELMARVA POWER & LIGHT CO | VIENNA NO 9 | I | T | 500,000 | 1988 |
| PENNSYLVANIA ELECTRIC CO | SEWARD NO 7 | I | T | 625,000 | 1989 |
| +PENNSYLVANIA POWER & LIGHT CO | SUSQUEHANNA NO 1 | I | N | 1,050,000 | 1983 |
| +PENNSYLVANIA POWER & LIGHT CO | SUSQUEHANNA NO 2 | I | N | 1,050,000 | 1984 |
| PHILADELPHIA ELECTRIC CO | LIMERICK NO 1 | I | N | 1,055,000 | 1985 |
| PHILADELPHIA ELECTRIC CO | LIMERICK NO 2 | I | N | 1,055,000 | 1987 |
| POTOMAC ELECTRIC POWER CO | CHALK POINT NO 4 | I | T | 600,000 | 1982 |
| +PUBLIC SERVICE ELECTRIC & GAS CO | HOPE CREEK NO 1 | I | N | 1,067,000 | 1986 |
| PUBLIC SERVICE ELECTRIC & GAS CO | HOPE CREEK NO 2 | I | N | 1,067,000 | 1989 |
| +PUBLIC SERVICE ELECTRIC & GAS CO | SALEM NUCLEAR NO 2 | I | N | 1,115,000 | 1981 |

## ECAR

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| AMERICAN ELECTRIC POWER CO | LEWIS COUNTY | I | T | 1,300,000 | 1989 |
| AMERICAN ELECTRIC POWER CO | RACINE DAM A | I | H | 20,000 | 1983 |
| AMERICAN ELECTRIC POWER CO | RACINE DAM B | I | H | 20,000 | 1983 |
| AMERICAN ELECTRIC POWER CO | ROCKPORT NO 1 | I | T | 1,300,000 | 1984 |
| AMERICAN ELECTRIC POWER CO | ROCKPORT NO 2 | I | T | 1,300,000 | 1986 |
| ○BAY CITY MICHIGAN | MUNI PWR PLANT | M | D | 5,500 | 1981 |
| ○BIG RIVERS ELECTRIC CORP | D B WILSON NO 1 | C | T | 395,000 | 1984 |
| ○BIG RIVERS ELECTRIC CORP | D B WILSON NO 2 | C | T | 395,000 | 1985 |
| CINCINNATI GAS & ELECTRIC CO | EAST BEND NO 1 | I | T | 600,000 | 1988 |
| CINCINNATI GAS & ELECTRIC CO | ZIMMER NO 1 | I | N | 800,000 | 1982 |
| CLEVELAND ELECTRIC ILLUMINATING CO | PERRY NO 1 | I | N | 1,205,000 | 1984 |
| CLEVELAND ELECTRIC ILLUMINATING CO | PERRY NO 2 | I | N | 1,205,000 | 1988 |
| COLUMBUS OHIO | REFUSE NINE | M | T | 15,000 | 1981 |
| COLUMBUS OHIO | REFUSE TEN | M | T | 15,000 | 1981 |
| COLUMBUS OHIO | REFUSE ELEVEN | M | T | 15,000 | 1981 |
| COLUMBUS & SOUTHERN OHIO ELECTRIC CO | POSTON NO 5 | I | T | 375,000 | 1992 |
| COLUMBUS & SOUTHERN OHIO ELECTRIC CO | POSTON NO 6 | I | T | 375,000 | 1992 |
| CONSUMERS POWER CO | MIDLAND NO 1 | I | N | 530,000 | 1984 |
| CONSUMERS POWER CO | MIDLAND NO 2 | I | N | 805,000 | 1983 |
| DAYTON POWER & LIGHT CO | KILLEN NO 2 | I | T | 520,000 | 1982 |

## ECAR
Continued

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| DETROIT EDISON CO | BELLE RIVER NO 1 | I | T | 676,000 | 1984 |
| DETROIT EDISON CO | BELLE RIVER NO 2 | I | T | 676,000 | 1985 |
| DETROIT EDISON CO | FERMI NO 2 | I | N | 1,093,000 | 1983 |
| +DUQUESNE LIGHT CO | BEAVER VALLEY NO 2 | I | N | 833,000 | 1986 |
| EAST KENTUCKY POWER COOP | SMITH NO 1 | C | T | 600,000 | 1985 |
| EAST KENTUCKY POWER COOP | SMITH NO 2 | C | T | 600,000 | 1987 |
| EAST KENTUCKY POWER COOP | SPURLOCK NO 2 | C | T | 500,000 | 1981 * |
| HOOSIER ENERGY DIVISION | MERCM NO 1 | C | T | 500,000 | 1981 |
| INDIANAPOLIS POWER & LIGHT CO | PETERSBURG NO 4 | I | T | 515,000 | 1985 |
| KENTUCKY UTILITIES CO | GHENT NO 3 | I | T | 500,000 | 1981 |
| KENTUCKY UTILITIES CO | GHENT NO 4 | I | T | 500,000 | 1984 |
| KENTUCKY UTILITIES CO | HANCOCK NO 1 | I | T | 650,000 | 1989 |
| KENTUCKY UTILITIES CO | HANCOCK NO 2 | I | T | 650,000 | 1994 |
| LOUISVILLE GAS & ELECTRIC CO | MILL CREEK NO 4 | I | T | 495,000 | 1982 |
| LOUISVILLE GAS & ELECTRIC CO | TRIMBLE COUNTY NO 1 | I | T | 495,000 | 1985 |
| LOUISVILLE GAS & ELECTRIC CO | TRIMBLE COUNTY NO 2 | I | T | 495,000 | 1989 |
| NORTHERN INDIANA PUBLIC SERVICE CO | BAILLY NUCLEAR NO 1 | I | N | 644,000 | 1989 |
| NORTHERN INDIANA PUBLIC SERVICE CO | SCHAHFER NO 17 | I | T | 344,000 | 1983 |
| NORTHERN INDIANA PUBLIC SERVICE CO | SCHAHFER NO 18 | I | T | 344,000 | 1985 |
| PUBLIC SERVICE CO OF INDIANA | GIBSON NO 5 | I | T | 650,000 | 1982 |
| PUBLIC SERVICE CO OF INDIANA | MARBLE HILL NO 1 | I | N | 938,000 | 1986 |
| PUBLIC SERVICE CO OF INDIANA | MARBLE HILL NO 2 | I | N | 938,000 | 1987 |
| SOUTHERN INDIANA GAS & ELECTRIC CO | BROWN NO 2 | I | T | 250,000 | 1985 |
| ○SOUTHERN INDIANA GAS & ELECTRIC CO | OHIO RIVER | I | G | 70,000 | 1986 |
| ○STURGIS MICHIGAN | MUNICIPAL LIGHT PLT | M | D | 6,000 | 1982 |

## SERC

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|---|---|---|---|---|---|
| ○ALABAMA ELECTRIC COOP | TOMBIGBEE NO 2 | C | T | 235,000 | 1987 |
| ○ALABAMA ELECTRIC COOP | TOMBIGBEE NO 3 | C | T | 235,000 | 1987 |
| ALABAMA POWER CO | FARLEY NO 2 | I | N | 807,000 | 1981 |
| ALABAMA POWER CO | HARRIS NO 1 | I | H | 58,600 | 1983 |
| ALABAMA POWER CO | HARRIS NO 2 | I | H | 58,600 | 1983 |
| ALABAMA POWER CO | MILLER NO 2 | I | T | 654,000 | 1985 |
| ALABAMA POWER CO | MILLER NO 3 | I | T | 654,000 | 1989 |
| ALABAMA POWER CO | MILLER NO 4 | I | T | 654,000 | 1991 |
| ALABAMA POWER CO | MITCHELL NO 5 | I | H | 50,000 | 1985 |
| ALABAMA POWER CO | MITCHELL NO 6 | I | H | 50,000 | 1985 |
| ALABAMA POWER CO | MITCHELL NO 7 | I | H | 50,000 | 1985 |
| CAROLINA POWER & LIGHT CO | HARRIS NO 1 | I | N | 900,000 | 1985 |
| CAROLINA POWER & LIGHT CO | HARRIS NO 2 | I | N | 900,000 | 1988 |
| CAROLINA POWER & LIGHT CO | HARRIS NO 3 | I | N | 900,000 | 1994 |
| CAROLINA POWER & LIGHT CO | HARRIS NO 4 | I | N | 900,000 | 1992 |
| CAROLINA POWER & LIGHT CO | MAYO NO 1 | I | T | 720,000 | 1983 |
| CAROLINA POWER & LIGHT CO | MAYO NO 2 | I | T | 720,000 | 1990 |
| DUKE POWER CO | BAD CREEK NO 1 | I | R | 250,000 | 1990 |
| DUKE POWER CO | BAD CREEK NO 2 | I | R | 250,000 | 1990 |
| DUKE POWER CO | BAD CREEK NO 3 | I | R | 250,000 | 1991 |
| DUKE POWER CO | BAD CREEK NO 4 | I | R | 250,000 | 1991 |
| DUKE POWER CO | CATAWBA NO 1 | I | N | 1,145,000 | 1984 |
| DUKE POWER CO | CATAWBA NO 2 | I | N | 1,145,000 | 1985 |
| DUKE POWER CO | CHEROKEE NO 1 | I | N | 1,280,000 | 1990 |
| DUKE POWER CO | MCGUIRE NO 1 | I | N | 1,180,000 | 1981 |

# SERC
## Continued

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| DUKE POWER CO | MCGUIRE NO 2 | I | N | 1,180,000 | 1983 |
| FAYETTEVILLE NORTH CAROLINA | GAS TURBINE NO 8 | M | G | 23,500 | 1981 |
| FLORIDA POWER CORP | CRYSTAL RIVER NO 4 | I | T | 670,000 | 1982 |
| ○ FLORIDA POWER CORP | CRYSTAL RIVER NO 5 | I | T | 670,000 | 1984 |
| FLORIDA POWER & LIGHT CO | MARTIN NO 2 | I | T | 775,000 | 1981 |
| FLORIDA POWER & LIGHT CO | MARTIN NO 3 | I | T | 700,000 | 1987 |
| FLORIDA POWER & LIGHT CO | MARTIN NO 4 | I | T | 700,000 | 1988 |
| FLORIDA POWER & LIGHT CO | ST LUCIE NO 2 | I | N | 802,000 | 1983 |
| GAINESVILLE FLORIDA | DEERHAVEN NO 2 | M | T | 235,000 | 1981 |
| GEORGIA POWER CO | ROCKY MOUNTAIN NO 1 | I | R | 225,000 | 1987 |
| GEORGIA POWER CO | ROCKY MOUNTAIN NO 2 | I | R | 225,000 | 1987 |
| GEORGIA POWER CO | ROCKY MOUNTAIN NO 3 | I | R | 225,000 | 1987 |
| GEORGIA POWER CO | SCHERER NO 1 | I | T | 808,000 | 1982 |
| GEORGIA POWER CO | SCHERER NO 2 | I | T | 808,000 | 1984 |
| GEORGIA POWER CO | SCHERER NO 3 | I | T | 808,000 | 1987 |
| GEORGIA POWER CO | SCHERER NO 4 | I | T | 808,000 | 1989 |
| GEORGIA POWER CO | VOGTLE NO 1 | I | N | 1,150,000 | 1985 |
| GEORGIA POWER CO | VOGTLE NO 2 | I | N | 1,150,000 | 1987 |
| GULF POWER CO | CARYVILLE NO 1 | I | T | 503,000 | 1995 |
| GULF POWER CO | CARYVILLE NO 2 | I | T | 503,000 | 1999 |
| ○ JACKSONVILLE FLORIDA | ST JOHNS RIVER PK 1 | M | T | 525,000 | 1985 |
| ○ JACKSONVILLE FLORIDA | ST JOHNS RIVER PK 2 | M | T | 525,000 | 1987 |
| LAKELAND FLORIDA | MC INTOSH NO 3 | M | T | 334,000 | 1981 |
| MISSISSIPPI POWER CO | PLANT DANIEL NO 2 | I | T | 503,000 | 1981 |
| SEMINOLE ELECTRIC COOP | SEMINOLE NO 1 | C | T | 600,000 | 1983 |
| SEMINOLE ELECTRIC COOP | SEMINOLE NO 2 | C | T | 600,000 | 1985 |
| SOUTH CAROLINA ELECTRIC & GAS CO | SUMMER NO 1 | I | N | 900,000 | 1982 |
| SOUTH CAROLINA PUBLIC SERVICE AUTHORITY | CROSS NO 1 | SL | T | 450,000 | 1986 |
| SOUTH CAROLINA PUBLIC SERVICE AUTHORITY | CROSS NO 2 | SL | T | 450,000 | 1984 |
| SOUTH CAROLINA PUBLIC SERVICE AUTHORITY | WINYAH NO 4 | SL | T | 280,000 | 1981 |
| TAMPA ELECTRIC CO | BIG BEND NO 4 | I | T | 417,000 | 1985 |
| TENNESSEE VALLEY AUTHORITY | BELLEFONTE NO 1 | F | N | 1,176,975 | 1985 |
| TENNESSEE VALLEY AUTHORITY | BELLEFONTE NO 2 | F | N | 1,176,975 | 1986 |
| TENNESSEE VALLEY AUTHORITY | HARTSVILLE NO 1 | F | N | 1,233,000 | 1988 |
| TENNESSEE VALLEY AUTHORITY | HARTSVILLE NO 2 | F | N | 1,233,000 | 1989 |
| TENNESSEE VALLEY AUTHORITY | HARTSVILLE NO 3 | F | N | 1,233,000 | 1995 |
| TENNESSEE VALLEY AUTHORITY | HARTSVILLE NO 4 | F | N | 1,233,000 | 1996 |
| TENNESSEE VALLEY AUTHORITY | PHIPPS BEND NO 1 | F | N | 1,233,000 | 1989 |
| TENNESSEE VALLEY AUTHORITY | PHIPPS BEND NO 2 | F | N | 1,233,000 | 1994 |
| TENNESSEE VALLEY AUTHORITY | SEQUOYAH NO 1 | F | N | 1,148,000 | 1981 |
| TENNESSEE VALLEY AUTHORITY | SEQUOYAH NO 2 | F | N | 1,148,000 | 1982 |
| TENNESSEE VALLEY AUTHORITY | WATTS BAR NO 1 | F | N | 1,177,000 | 1984 |
| TENNESSEE VALLEY AUTHORITY | WATTS BAR NO 2 | F | N | 1,177,000 | 1984 |
| TENNESSEE VALLEY AUTHORITY | YELLOW CREEK NO 1 | F | N | 1,285,000 | 1988 |
| TENNESSEE VALLEY AUTHORITY | YELLOW CREEK NO 2 | F | N | 1,285,000 | 1993 |
| U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 1 | F | H | 75,000 | 1984 |
| U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 2 | F | H | 75,000 | 1984 |
| U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 3 | F | H | 75,000 | 1984 |
| U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 4 | F | H | 75,000 | 1984 |
| U S ARMY CORPS OF ENGINEERS | ST STEPHEN NO 1 | F | H | 20,000 | 1983 |
| U S ARMY CORPS OF ENGINEERS | ST STEPHEN NO 2 | F | H | 20,000 | 1983 |
| U S ARMY CORPS OF ENGINEERS | ST STEPHEN NO 3 | F | H | 20,000 | 1983 |
| VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 1 | I | R | 350,000 | 1985 |

## SERC
Continued

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 2 | I | R | 350,000 | 1985 |
| VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 3 | I | R | 350,000 | 1986 |
| VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 4 | I | R | 350,000 | 1985 |
| VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 5 | I | R | 350,000 | 1986 |
| VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 6 | I | R | 350,000 | 1986 |
| VIRGINIA ELECTRIC & POWER CO | NORTH ANNA NO 3 | I | N | 907,000 | 1989 |

## MAIN

| | | | | | |
|---|---|---|---|---|---|
| CENTRAL ILLINOIS LIGHT CO | DUCK CREEK NO 2 | I | T | 400,000 | 1986 |
| CENTRAL ILLINOIS PUBLIC SERVICE CO | NEWTON NO 2 | I | T | 575,000 | 1982 |
| COMMONWEALTH EDISON CO | BRAIDWOOD NO 1 | I | N | 1,120,000 | 1985 |
| COMMONWEALTH EDISON CO | BRAIDWOOD NO 2 | I | N | 1,120,000 | 1986 |
| COMMONWEALTH EDISON CO | BYRON NO 1 | I | N | 1,120,000 | 1983 |
| COMMONWEALTH EDISON CO | BYRON NO 2 | I | N | 1,120,000 | 1984 |
| COMMONWEALTH EDISON CO | LASALLE COUNTY NO 1 | I | N | 1,078,000 | 1982 |
| COMMONWEALTH EDISON CO | LASALLE COUNTY NO 2 | I | N | 1,078,000 | 1982 |
| ILLINOIS POWER CO | CLINTON NO 1 | I | N | 950,000 | 1983 |
| MARQUETTE MICHIGAN | SHIRAS NO 3 | M | T | 44,000 | 1982 |
| SIKESTON MISSOURI | COLEMAN NO 2 | M | T | 235,000 | 1981 |
| ○ SOYLAND POWER COOPERATIVE | SOYLAND NO 1 | C | T | 450,000 | 1987 |
| UNION ELECTRIC CO | CALLAWAY NO 1 | I | N | 1,150,000 | 1983 |
| UNION ELECTRIC CO | CALLAWAY NO 2 | I | N | 1,150,000 | 1990 |
| WISCONSIN ELECTRIC POWER CO | PLEASANT PRAIRIE NO 2 | I | T | 580,000 | 1984 |
| WISCONSIN POWER & LIGHT CO | EDGEWATER NO 5 | I | T | 400,000 | 1984 |
| WISCONSIN PUBLIC SERVICE CORP | WESTON NO 3 | I | T | 300,000 | 1982 |

## SPP

| | | | | | |
|---|---|---|---|---|---|
| ARKANSAS POWER & LIGHT CO | ALEC NO 1 | I | T | 800,000 | 1990 |
| ARKANSAS POWER & LIGHT CO | ALEC NO 2 | I | T | 800,000 | 1992 |
| ARKANSAS POWER & LIGHT CO | INDEPENDENCE NO 1 | I | T | 816,000 | 1983 |
| ARKANSAS POWER & LIGHT CO | INDEPENDENCE NO 2 | I | T | 816,000 | 1985 |
| + ARKANSAS POWER & LIGHT CO | WHITE BLUFF NO 2 | I | T | 816,000 | 1981 |
| ASSOCIATED ELECTRIC COOP INC | THOMAS HILL NO 3 | C | T | 630,000 | 1982 |
| ○ AUGUSTA KANSAS | MUNICIPAL LIGHT PLT | M | D | 6,000 | 1981 |
| CAJUN ELECTRIC POWER COOP | BIG CAJUN TWO NO 2 | C | T | 540,000 | 1981 |
| CAJUN ELECTRIC POWER COOP | BIG CAJUN TWO NO 3 | C | T | 540,000 | 1983 |
| CAJUN ELECTRIC POWER COOP | BIG CAJUN 3 NO 1 | C | T | 540,000 | 1985 |
| CAJUN ELECTRIC POWER COOP | BIG CAJUN FOUR NO 1 | C | T | 540,000 | 1986 |
| CENTRAL LOUISIANA ELECTRIC CO | RODEMACHER NO 2 | I | T | 530,000 | 1982 |
| EMPIRE DISTRICT ELECTRIC CO | EMPIRE ENERGY CENTER | I | G | 90,000 | 1981 |
| GRAND RIVER DAM AUTHORITY | CHOUTEAU NO 1 | SL | T | 490,000 | 1981 |
| GULF STATES UTILITIES CO | LOVELADY NO 1 | I | T | 300,000 | 1990 |
| GULF STATES UTILITIES CO | NELSON NO 5 | I | T | 540,000 | 1987 |
| GULF STATES UTILITIES CO | NELSON NO 6 | I | T | 540,000 | 1982 |
| ○ GULF STATES UTILITIES CO | NELSON NO 7 | I | GC | 90,000 | 1983 |
| GULF STATES UTILITIES CO | RIVER BEND NO 1 | I | N | 940,000 | 1984 |
| GULF STATES UTILITIES CO | RIVER BEND NO 2 | I | N | 940,000 | 1991 |
| KANSAS CITY KANSAS | NEARMAN NO 1 | M | T | 235,000 | 1981 * |
| + KANSAS GAS & ELECTRIC CO | WOLF CREEK NO 1 | I | N | 1,150,000 | 1984 |
| + KANSAS POWER & LIGHT CO | JEFFREY ELEC CTR NO 3 | I | T | 680,000 | 1983 |
| + KANSAS POWER & LIGHT CO | JEFFREY ELEC CTR NO 4 | I | T | 680,000 | 1986 |
| LOUISIANA POWER & LIGHT CO | WATERFORD NO 3 | I | N | 1,104,000 | 1983 |
| LOUISIANA POWER & LIGHT CO | WILTON NO 1 | I | T | 800,000 | 1988 |
| LOUISIANA POWER & LIGHT CO | WILTON NO 2 | I | T | 800,000 | 1991 |
| MIDDLE SOUTH UTILITIES | EAST ORLEANS NO 1 | I | T | 800,000 | 1989 |

## SPP
Continued

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| MIDDLE SOUTH UTILITIES | EAST ORLEANS NO 2 | I | T | 750,000 | 1993 |
| MISSISSIPPI POWER & LIGHT CO | GRAND GULF NO 1 | I | N | 1,250,000 | 1982 |
| MISSISSIPPI POWER & LIGHT CO | GRAND GULF NO 2 | I | N | 1,250,000 | 1988 |
| ○MISSOURI PUBLIC SERVICE CO | RALPH GREEN NO 3 | I | G | 79,000 | 1981 |
| OKLAHOMA GAS & ELECTRIC CO | MUSKOGEE NO 6 | I | T | 515,000 | 1984 |
| PUBLIC SERVICE CO OF OKLAHOMA | BLACK FOX NO 1 | I | N | 1,150,000 | 1991 |
| PUBLIC SERVICE CO OF OKLAHOMA | BLACK FOX NO 2 | I | N | 1,150,000 | 1994 |
| ○SOUTHWESTERN ELECTIC POWER CO | PIRKEY NO 1 | I | T | 640,000 | 1985 |
| SOUTHWESTERN ELECTRIC POWER CO | WELSH NO 3 | I | T | 528,000 | 1982 |
| SOUTHWESTERN PUBLIC SERVICE CO | TOLK NO 1 | I | T | 508,000 | 1982 |
| SOUTHWESTERN PUBLIC SERVICE CO | TOLK NO 2 | I | T | 508,000 | 1985 |
| SUNFLOWER ELECTRIC COOP | HOLCOMB NO 1 | C | T | 280,000 | 1983 |
| U S ARMY CORPS OF ENGINEERS | CANNON NO 2 | F | H | 27,000 | 1983 |
| U S ARMY CORPS OF ENGINEERS | CANNON NO 1 | F | R | 31,000 | 1983 |
| U S ARMY CORPS OF ENGINEERS | TRUMAN NO 1 | F | R | 26,666 | 1981 |
| U S ARMY CORPS OF ENGINEERS | TRUMAN NO 2 | F | R | 26,667 | 1981 |
| U S ARMY CORPS OF ENGINEERS | TRUMAN NO 3 | F | R | 26,667 | 1981 |
| U S ARMY CORPS OF ENGINEERS | TRUMAN NO 4 | F | R | 26,666 | 1981 |
| U S ARMY CORPS OF ENGINEERS | TRUMAN NO 5 | F | R | 26,667 | 1985 |
| U S ARMY CORPS OF ENGINEERS | TRUMAN NO 6 | F | R | 26,667 | 1985 |
| WESTERN FARMERS ELECTRIC COOPERATIVE | EAST OKLAHOMA COAL NO 1 | C | T | 376,000 | 1982 |

## ERCOT

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| +BRAZOS ELECTRIC POWER COOP | SAN MIGUEL NO 1 | C | T | 400,000 | 1982 |
| CENTRAL POWER & LIGHT CO | COLETO CREEK NO 2 | I | T | 700,000 | 1989 |
| HOUSTON LIGHTING & POWER CO | ALLENS CREEK NO 1 | I | N | 1,130,000 | 1988 |
| HOUSTON LIGHTING & POWER CO | LIMESTONE NO 1 | I | T | 700,000 | 1985 |
| HOUSTON LIGHTING & POWER CO | LIMESTONE NO 2 | I | T | 700,000 | 1986 |
| HOUSTON LIGHTING & POWER CO | PARISH NO 8 | I | T | 540,000 | 1983 |
| +HOUSTON LIGHTING & POWER CO | SOUTH TEXAS NO 1 | I | N | 1,250,000 | 1984 |
| +HOUSTON LIGHTING & POWER CO | SOUTH TEXAS NO 2 | I | N | 1,250,000 | 1986 |
| TEXAS MUNICIPAL POWER AGENCY | GIBBONS CREEK NO 1 | M | T | 400,000 | 1982 |
| ○TEXAS MUNICIPAL POWER AGENCY | GIBBONS CREEK NO 2 | M | T | 400,000 | 1987 |
| +TEXAS UTILITIES CO SYSTEM | COMANCHE PEAK NO 1 | I | N | 1,150,000 | 1982 |
| +TEXAS UTILITIES CO SYSTEM | COMANCHE PEAK NO 2 | I | N | 1,150,000 | 1984 |
| TEXAS UTILITIES CO SYSTEM | FOREST GROVE NO 1 | I | T | 750,000 | 1989 |
| +TEXAS UTILITIES CO SYSTEM | MARTIN LAKE NO 4 | I | T | 750,000 | 1990 |
| +TEXAS UTILITIES CO SYSTEM | SANDOW NO 4 | I | T | 545,000 | 1981 |
| +TEXAS UTILITIES CO SYSTEM | TWIN OAK NO 1 | I | T | 750,000 | 1986 |
| +TEXAS UTILITIES CO SYSTEM | TWIN OAK NO 2 | I | T | 750,000 | 1988 |
| WEST TEXAS UTILITIES CO | OKLAUNION NO 1 | I | T | 640,000 | 1986 |

## MARCA

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| AMES IOWA | AMES NO 8 | M | T | 60,000 | 1981 |
| BASIN ELECTRIC POWER COOP | ANTELOPE VALLEY NO1 | C | T | 416,000 | 1983 |
| BASIN ELECTRIC POWER COOP | ANTELOPE VALLEY NO2 | C | T | 416,000 | 1985 |
| +BASIN ELECTRIC POWER COOPERATIVE | LARAMIE RIVER NO 2 | C | T | 550,000 | 1981 |
| ○FALLS CITY NEBRASKA | MUNI LIGHT PLANT | M | D | 6,000 | 1981 |
| GRAND ISLAND NEBRASKA | PLATT NO 1 | M | T | 100,000 | 1981 |
| HASTINGS NEBRASKA | ENERGY CENTER NO 1 | M | T | 70,000 | 1981 |
| ○IOWA ELECTRIC LIGHT & POWER CO | GUTHRIE COUNTY NO 1 | I | T | 650,000 | 1985 |
| +IOWA-ILLINOIS GAS & ELECTRIC CO | LOUISA NO 1 | I | T | 650,000 | 1983 |
| IOWA PUBLIC SERVICE CO | NEAL NO 5 | I | T | 400,000 | 1988 |
| +IOWA SOUTHERN UTILITIES CO | OTTUMWA NO 1 | I | T | 675,000 | 1981 |
| MINNESOTA POWER & LIGHT CO | OLIVER COUNTY NO 1 | I | T | 500,000 | 1988 |
| MUSCATINE IOWA | MUSCATINE NO 9 | M | T | 150,000 | 1982 |

## MARCA
Continued

| System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|
| NEBRASKA PUBLIC POWER DISTRICT | GENTLEMAN NO 2 | SL | T | 600,000 | 1981 |
| ○NEBRASKA PUBLIC POWER DISTRICT | KINGSLEY NO 1 | SL | H | 36,000 | 1984 |
| ○NEW PRAGUE MINNESOTA | MUNICIPAL LT PLANT | M | D | 5,000 | 1981 |
| ◆NORTHERN STATES POWER CO | SHERBURNE COUNTY NO3 | I | T | 800,000 | 1986 |
| ◆OTTER TAIL POWER CO | COYOTE NO 1 | I | T | 410,000 | 1981 |
| ○OTTER TAIL POWER CO | SPIRITWOOD NO 1 | I | T | 108,000 | 1986 |
| ARIZONA PUBLIC SERVICE CO | CHOLLA NO 4 | I | T | 347,000 | 1981 |
| ARIZONA PUBLIC SERVICE CO | CHOLLA NO 5 | I | T | 340,000 | 1990 |
| ARIZONA PUBLIC SERVICE CO | PALO VERDE NO 1 | I | N | 1,270,000 | 1983 |
| ARIZONA PUBLIC SERVICE CO | PALO VERDE NO 2 | I | N | 1,270,000 | 1984 |
| ARIZONA PUBLIC SERVICE CO | PALO VERDE NO 3 | I | N | 1,270,000 | 1986 |
| BASIN ELECTRIC POWER COOP | LARAMIE RIVER NO 3 | C | T | 550,000 | 1982 |
| CALIFORNIA DEPT OF WATER RESOURCES | PYRAMID NO 1 | SL | H | 38,000 | 1982 |
| CALIFORNIA DEPT OF WATER RESOURCES | PYRAMID NO 2 | SL | H | 38,000 | 1982 |
| COLORADO-UTE ELECTRIC ASSOCIATION | CRAIG NO 3 | C | T | 400,000 | 1983 |
| DESERET G & T COOP | MOON LAKE NO 1 | C | T | 360,000 | 1985 |
| EL PASO ELECTRIC CO | COMBUSTION TURBINE | I | G | 95,000 | 1981 |
| MODESTO IRRIGATION DISTRICT | MC CLURE R | SL | G | 49,000 | 1981 |
| ◆MONTANA POWER CO | COLSTRIP NO 3 | I | T | 700,000 | 1984 |
| ◆MONTANA POWER CO | COLSTRIP NO 4 | I | T | 700,000 | 1985 |
| NEVADA POWER CO | CLARK NO 8 | I | G | 70,000 | 1982 |
| NEVADA POWER CO | REID GARDNER NO 4 | I | T | 250,000 | 1983 |
| NEVADA POWER CO | WARNER VALLEY NO 1 | I | T | 250,000 | 1985 |
| NEVADA POWER CO | WARNER VALLEY NO 2 | I | T | 250,000 | 1986 |
| PACIFIC GAS & ELECTRIC CO | DIABLO CANYON NO 1 | I | N | 1,084,000 | 1982 |
| PACIFIC GAS & ELECTRIC CO | DIABLO CANYON NO 2 | I | N | 1,106,000 | 1982 |
| PACIFIC GAS & ELECTRIC CO | GEYSERS NO 16 | I | T | 110,000 | 1983 |
| PACIFIC GAS & ELECTRIC CO | GEYSERS NO 17 | I | T | 110,000 | 1982 |
| PACIFIC GAS & ELECTRIC CO | HELMS NO 1 | I | R | 374,000 | 1982 |
| PACIFIC GAS & ELECTRIC CO | HELMS NO 2 | I | R | 374,000 | 1982 |
| PACIFIC GAS & ELECTRIC CO | HELMS NO 3 | I | R | 375,000 | 1982 |
| PACIFIC GAS & ELECTRIC CO | KERCKHOFF NO 2 | I | H | 151,000 | 1983 |
| ○PACIFIC POWER & LIGHT CO | WYODAK NO 2 | I | T | 310,000 | 1986 |
| PLAINS ELECTRIC GENERATION&TRANSMISSION | ESCALANTE NO 1 | C | T | 210,000 | 1984 |
| PLATTE RIVER POWER AUTHORITY | RAWHIDE NO 1 | SL | T | 250,000 | 1984 |
| PORTLAND GENERAL ELECTRIC CO | PEBBLE SPRINGS NO 1 | I | N | 1,260,000 | 1992 |
| PUBLIC SERVICE CO OF COLORADO | PAWNEE NO 1 | I | T | 470,000 | 1981 |
| PUBLIC SERVICE CO OF COLORADO | SOUTHEASTERN NO 1 | I | T | 470,000 | 1987 |
| PUBLIC SERVICE CO OF COLORADO | SOUTHEASTERN NO 2 | I | T | 470,000 | 1989 |
| PUBLIC SERVICE CO OF NEW MEXICO | BACA | I | T | 48,000 | 1982 |
| PUBLIC SERVICE CO OF NEW MEXICO | NEW MEXICO STATION | I | T | 500,000 | 1990 |
| ◆PUBLIC SERVICE CO OF NEW MEXICO | SAN JUAN NO 4 | I | T | 472,000 | 1982 |
| PUGET SOUND POWER & LIGHT CO | SKAGIT NO 1 | I | N | 1,288,000 | 1991 |
| PUGET SOUND POWER & LIGHT CO | SKAGIT NO 2 | I | N | 1,288,000 | 1993 |
| PUGET SOUND POWER & LIGHT CO | FREDERICKSON WASH | I | G | 178,200 | 1901 |
| PUGET SOUND POWER & LIGHT CO | WHITEHORN NOS 263 | I | G | 178,000 | 1981 |
| SALT RIVER POWER DISTRICT | CORONADO NO 3 | SL | T | 350,000 | 1992 |
| SIERRA PACIFIC POWER CO | VALMY NO 1 | I | T | 250,000 | 1981 |
| SIERRA PACIFIC POWER CO | VALMY NO 2 | I | T | 250,000 | 1984 |
| SOUTHERN CALIFORNIA EDISON CO | LUCERNE VALLEY CTS | I | G | 300,000 | 1994 |
| SOUTHERN CALIFORNIA EDISON CO | LUCERNE VALLEY CTS | I | G | 300,000 | 1996 |

## WSCC

## WSCC
Continued

| | System | Station | Owner-ship | Type | Exp. Net Capability | Sched. Date of Operation |
|---|---|---|---|---|---|---|
| | SOUTHERN CALIFORNIA EDISON CO | LUCERNE VALLEY CTS | I | G | 240,000 | 1998 |
| * | SOUTHERN CALIFORNIA EDISON CO | SAN ONOFRE NO 2 | I | N | 1,100,000 | 1982 |
| * | SOUTHERN CALIFORNIA EDISON CO | SAN ONOFRE NO 3 | I | N | 1,100,000 | 1983 |
| o | SOUTHERN CALIFORNIA EDISON CO | SOLAR ONE | I | T | 12,000 | 1981 |
| | TACOMA WASHINGTON | MAYFIELD NO 4 | M | H | 39,000 | 1982 |
| | TUCSON GAS & ELECTRIC CO | SPRINGERVILLE NO 1 | I | T | 350,000 | 1985 |
| | TUCSON GAS & ELECTRIC CO | SPRINGERVILLE NO 2 | I | T | 350,000 | 1987 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM F-1 | F | H | 15,000 | 1981 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM F-2 | F | H | 15,000 | 1981 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 18 | F | H | 76,000 | 1981 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 17 | F | H | 76,000 | 1981 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 16 | F | H | 76,000 | 1981 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 15 | F | H | 76,000 | 1981 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 14 | F | H | 76,000 | 1982 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 13 | F | H | 76,000 | 1982 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 12 | F | H | 76,000 | 1982 |
| | U S ARMY CORPS OF ENGINEERS | BONNEVILLE DAM NO 11 | F | H | 76,000 | 1982 |
| | U S ARMY CORPS OF ENGINEERS | LIBBY NO 5 | F | H | 121,000 | 1984 |
| | U S ARMY CORPS OF ENGINEERS | LIBBY NO 6 | F | H | 121,000 | 1984 |
| | U S ARMY CORPS OF ENGINEERS | LIBBY NO 7 | F | H | 121,000 | 1984 |
| | U S ARMY CORPS OF ENGINEERS | LIBBY NO 8 | F | H | 121,000 | 1984 |
| | U S BUREAU OF RECLAMATION | GRAND COULEE PG-9 | F | H | 50,000 | 1981 |
| | U S BUREAU OF RECLAMATION | GRAND COULEE PG-10 | F | H | 50,000 | 1981 |
| | U S BUREAU OF RECLAMATION | GRAND COULEE PG-11 | F | H | 50,000 | 1981 |
| | U S BUREAU OF RECLAMATION | GRAND COULEE PG-12 | F | H | 50,000 | 1982 |
| | U S BUREAU OF RECLAMATION | MT ELBERT NO 1 | F | H | 100,000 | 1981 |
| | U S BUREAU OF RECLAMATION | MT ELBERT NO 2 | F | H | 100,000 | 1983 |
| | UTAH POWER & LIGHT CO | HUNTER NO 3 | I | T | 400,000 | 1983 |
| | UTAH POWER & LIGHT CO | HUNTER NO 4 | I | T | 400,000 | 1985 |
| o * | UTAH POWER & LIGHT CO | INTERMOUNTAIN NO 1 | I | T | 750,000 | 1986 |
| o * | UTAH POWER & LIGHT CO | INTERMOUNTAIN NO 2 | I | T | 750,000 | 1987 |
| o * | UTAH POWER & LIGHT CO | INTERMOUNTAIN NO 3 | I | T | 750,000 | 1988 |
| o * | UTAH POWER & LIGHT CO | INTERMOUNTAIN NO 4 | I | T | 750,000 | 1988 |
| | WARM SPRINGS OREGON INDIAN RESERVATION | PELTON DAM OREGON | SL | H | 21,000 | 1982 |
| | WASHINGTON PUBLIC POWER SUPPLY SYSTEM | WNP NO 2 | SL | N | 1,100,000 | 1984 |
| | WASHINGTON PUBLIC POWER SUPPLY SYSTEM | WNP NO 3 | SL | N | 1,240,000 | 1986 |
| | WASHINGTON PUBLIC POWER SUPPLY SYSTEM | WNP NO 1 | SL | N | 1,250,000 | 1986 |
| | WASHINGTON PUBLIC POWER SUPPLY SYSTEM | WNP NO 4 | SL | N | 1,250,000 | 1987 |
| | WASHINGTON PUBLIC POWER SUPPLY SYSTEM | WNP NO 5 | SL | N | 1,240,000 | 1987 |

NUMBER OF UNITS = 347 AMOUNT OF EXP. NET CAPABILITY = 193,563,150